A

TRANSLATION

OF THE

PHARMACOPŒIA

OF THE

ROYAL COLLEGE OF PHYSICIANS
OF LONDON,

1836.

WITH NOTES AND ILLUSTRATIONS.

BY

RICHARD PHILLIPS, F.R.S. L. & E. &c.

OF THE MUSEUM OF ECONOMIC GEOLOGY, AND

FORMERLY LECTURER ON CHEMISTRY AT ST. THOMAS'S HOSPITAL.

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TO

CLEMENT HUE, M.D.

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS,
AND SENIOR PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL,
&c. &c.

My Dear Sir,

Induced by various motives I inscribe this Translation to you. I have witnessed the unremitting zeal which directed your scientific attainments to the improvement of the original Work, and the candour with which you appreciated the suggestions of others. I am moreover desirous of acknowledging the obligation which I am under to you, for the assistance rendered me on many important occasions connected with this publication.

I remain,

My dear Sir,

Yours faithfully,

RICHARD PHILLIPS.

St. Thomas's Hospital,
December, 1836.

PREFACE.

CONSIDERING how much has been effected in the present age towards extending and almost re-creating the arts on which the science of Medicine depends, it will excite no surprise that the Pharmacopœia published twelve years ago, should have become somewhat imperfect and obsolete. The College of Physicians had long ago determined on revising and reforming it, but many circumstances prevented its completion. For not only is it always a difficult undertaking to collect and justly to appreciate the opinions of a number of persons, but it was frequently our duty to examine the most trivial points, and carefully to consider the rejection or improvement of what had become antiquated, and the admission of what was new, and to judge of the best mode of carrying these alterations into effect. On these points we have been much engaged. However, but little progress had been made when a fresh difficulty arose; as we were desirous of compiling, not as before, a London Pharmacopœia, but one which should include Scotland and Ireland with England, it was requisite to consult with the Fellows of both Colleges; and as, on account of the great distance, this was with difficulty accomplished,

we were at length constrained to abandon the negotiation which had been commenced.

This is not a proper occasion for stating by what individuals or by what means the boundaries of Science have been enlarged; though the College of Physicians claim as members, many among those who have greatly promoted its extension. When, however, the knowledge of all Nature had made such rapid advances, it would have been unworthy of Medicine to have remained stationary in that department which relates to remedies.

It will here be proper briefly to explain what we have effected. We have not been satisfied with describing a number of medicines without thoroughly examining them all; we have especially subjected the chemical preparations, which have yearly increased in number and importance, to the test of rigid experiment. If some of these should appear but little approved by experience, we have nevertheless included them in this Work, that if any one should think fit to administer them, he might have all accurately prepared. Lest anything further should be wanting to complete the Work, or to the security of the sick, we have now for the first time added short notes, by which the purity of the medicines required may be for the most part easily ascertained, sufficiently, at least, for the use of physicians and students in medicine, if not always for the exact analysis of chemists.

We have usually omitted to mention the methods of preparing such medicines as may be had sufficiently pure and without trouble from those who deal in them; though we certainly had rather that some of them should be prepared according to our directions, than trust to the attention or inattention of others. And although more beautiful crystals and of brighter colour are elsewhere produced on account of the more abundant materials

which are employed, these are circumstances which do not at all contribute towards the alleviation of disease.

There is also this novelty in our Pharmacopœia, that we have resolved to adopt an alphabetical arrangement; and if to some this plan should appear unsystematic, we wish to contribute rather to the convenience of the physician, than to consult the opinions of philosophers, or indulge the fancy of theorists. Some chemical substances are excepted from this arrangement, which, having a general connexion, and being united, as it were, by some kind of affinity, could not be separated with propriety.

In the present day it is scarcely necessary to discuss the change of names; for though all admit that it ought not to be done inconsiderately, yet it was to be feared, lest the avoidance of the error likely to arise from the change should lead to a greater one: we are persuaded that the name which the most eminent Professors of the science have bestowed upon a substance will eventually be the most certain and permanent. We have therefore determined to follow in their footsteps, and put up for a short time with inconvenience, if any should arise, or learn to speak barbarously, rather than incur the danger of becoming obscure from employing a doubtful or ill-defined expression. If we have ourselves invented one or two, we have done so in accordance with these principles.

Such are the observations with which we have thought proper to commence. We cannot hope to afford satisfaction to all, or that we have performed everything which we could have wished. Some, perhaps, will think our Work too copious; others too brief and limited. It has at any rate been our endeavour, if we could not please all, at least to benefit many; and we shall be gratified

if studious youths and the compounders of medicine, whether learned or unlearned, gather any fruit from our labour. But we have especially aimed at furnishing the household of the physician and consulting the welfare of the sick, that the former may more certainly and safely contend with diseases, and the latter be sooner restored to the wished-for enjoyment of health.

ADVERTISEMENT.

THE Royal College of Physicians having appointed a Committee to revise their Pharmacopœia, it may perhaps be allowed me to state, that I have, at their request, either conducted or inspected the preparation of almost every medicine which has been introduced, and in many cases repeated the processes which the Pharmacopœia already contained. While thus engaged, I have repeatedly received highly useful information from Mr. Hennell of Apothecaries' Hall, and I am anxious to express my sense of its value.

In preparing the remarks which accompany this Translation my attention has been directed to two classes of persons:—First, those who may have been for some time engaged in the practice of Physic, but who, not having watched the rapid progress which Chemistry has made within a few years, are imperfectly acquainted with the important changes which it has produced by the introduction of new medicines from various and unexpected sources.

The other class to which I allude is the numerous one of Medical Students ; to these I have found, by no inconsiderable experience, that concise descriptions of the chemical changes which occur during the preparation of medicines have been extremely useful. They who know how small the portion of time is which the medical pupil has at his disposal for the acquirement of chemical and pharmaceutical knowledge, will readily admit the propriety of assisting his progress by familiar modes of illustration. With this latter view I have made much use of diagrams, and I shall offer a few words in explanation of the method I have adopted in framing them. It is to be understood, that the new compounds formed during a process, or constituents assuming a fresh state, are denoted by being printed in *italics* : thus a solution of sulphate of soda being mixed with one of nitrate of lime, the new compounds formed are *sulphate of lime* and *nitrate of soda*, and supposing one of the resulting substances to be a solid, that is generally placed at the bottom of the diagram. When nitric acid is added to carbonate of lime, the carbonic acid assumes a fresh state, and in this case it is thus described—carbonic acid *gas* ; the only change which it undergoes being from the state of solid combination, to that of an uncombined elastic fluid.

In the alphabetical arrangement now adopted by the College, under the head of *Præparata è Potassio*, Liquor Potassæ correctly precedes Potassæ Carbo-

nas; but my object being that of explaining the nature of the chemical compounds, and of describing the causes upon which their difference depends, I have on this occasion, as well as in some other cases, altered the order, and have treated of carbonate of potash before the solution, because a knowledge of the properties of the carbonate must be acquired, before the separation of its carbonic acid by the action of the lime can be understood.

In my translation of the late Pharmacopœia I mentioned the properties which indicated the qualities of various medicines, and described the means which might be adopted for the detection of impurities and adulteration. This very useful appendage to a Pharmacopœia has now been introduced by the College, and to their original directions for this purpose I have added such remarks as it appeared to me might further the purpose of their introduction. The tests which have been proposed are the more necessary, because the College no longer insist that the medicines which they direct, should be prepared exactly in the mode prescribed, provided they will stand the trials of their purity, to which it is proposed they shall be submitted.

I have in many cases given the crystalline forms of various salts; and these, with scarcely any exception, have been derived from the communications of my friend Mr. Brooke to the Annals of Philosophy. I have also added the symbols of most chemical compounds, not that I would be under-

stood as admitting their utility, but in compliance with the practice of some of the most eminent chemists of the present day. From numerous plans which have been proposed I have selected the symbols given by Professor Brande in his Manual of Chemistry, and those of Berzelius: the latter are adopted, generally, without any other alterations than the slight ones sanctioned by Professor Turner in his Elements of Chemistry; and I have on many other occasions advantageously consulted both the excellent works now mentioned.

Well knowing how necessary it is that the student should be acquainted with the powers and doses of preparations, I have generally given an account of them; but not being a medical practitioner, the best authorities on the subject have been consulted and quoted, and I need do no more to inspire confidence in this statement, than to observe that I am chiefly indebted for them to Dr. Paris and Dr. Hue; and I have great pleasure in acknowledging their friendly assistance on various occasions connected with this translation.

R. P.

ADVERTISEMENT

TO THE

SECOND EDITION.

HAVING on several occasions shown that the critical remarks which have been made by various persons on the New Pharmacopœia, contain but little that affect the chemical portion of the work, I shall not now enter into a defence of it.

While however some of the more candid critics have admitted that improvements have been made, scarcely one of them, if I remember rightly, has named a single process in proof of it.

I shall therefore occupy a few pages in showing as briefly as possible in what processes imperfections principally existed in the late Pharmacopœia. It is to be understood, without particular reference to the new formulæ, that they are considered as remedying such defects. This I trust will be found sufficiently obvious to those who will take the trouble to make the requisite comparison.

R. P.

ST. THOMAS'S HOSPITAL,
March 1837.

Acetum Destillatum,—was called Acidum Aceticum dilutum. This name is improper, because distilled vinegar contains vegetable matter which prevents it from acting as pure acetic acid, in several cases, especially when saturated with potash; on evaporation the solution becomes of a dark colour, owing to the decomposition of the vegetable matter.

The first pint distilled was also ordered to be rejected, on account of its being weak; but as it contains nearly one-twelfth part of the vinegar distilled, it is now preserved. This saving is not attended with any inconvenience, unless rendering the product rather more dilute be so considered.

Acidum Benzoicum.—In this preparation a glass vessel was directed to be used in sublimation; it could scarcely be so employed without being broken. The operator is now at liberty to use such apparatus as he may think most convenient for the purpose.

Acidum Citricum.—The citrate of lime was directed to be dried previously to decomposition by the sulphuric acid: this operation was not merely useless, but if incautiously performed, might occasion the decomposition of the citrate. When used while yet moist, as now directed, the sulphuric acid must decompose it more readily. The quantity of chalk, though mentioned, was to be used subject to certain conditions, which however were not very

objectionable, but then the quantity of sulphuric acid should also have been conditional and dependent upon that of the chalk used. Supposing, however, all the chalk taken to have been required for converting the citric acid into citrate of lime, this salt would have required but little more than two-thirds of the sulphuric acid directed to be employed, unconditionally, for its decomposition.

The excess of sulphuric acid, amounting to nearly one-third of the whole quantity, would probably have prevented the crystallization of the citric acid, and even decomposed a portion of it.

Acidum Hydrochloricum.—The present name is more scientific than the former one of Acidum Muriaticum, since it indicates the elements of which the acid is composed.

The chloride of sodium was directed to be added to the sulphuric acid and water, previously put into the retort. This method of mixing is exceedingly inconvenient: the proportion of water used with the sulphuric acid was too small, and it was incorrectly stated that 100 grains of the acid produced, of sp. gr. 1·16, decomposed only 124 grains of carbonate of soda.

Acidum Nitricum.—The nitric was directed to be distilled only until a red vapour arose; and as this occurs as soon as the operation commences, it follows that scarcely any acid could be obtained. It was also ordered that the nitric acid should be redistilled with the addition of a quantity of nitrate of potash; this operation was entirely useless. The

saturating power of the nitric acid was incorrectly stated.

Acidum Tartaricum.—One half of the tartaric acid of the bitartrate of potash was wasted. The quantity of chalk necessary to be employed was not stated, as it might have been ; it was directed to be used until carbonic acid gas ceased to be evolved. Notwithstanding these conditional directions for the use of the chalk, the quantity of sulphuric acid ordered to be employed, unconditionally, was sufficient to decompose all the tartrate of lime, which the lime of the chalk would have yielded with the tartaric acid : less than two-thirds of the chalk mentioned was sufficient, and consequently more than one-third of the sulphuric acid was in excess, and this must have prevented the crystallization and probably decomposed a portion of the tartaric acid.

Æther Sulphuricus.—Two formulæ were directed for preparing this ; they are now reduced to one, and the directions are given with greater precision ; for the first portion of spirit was formerly taken by weight, and the second by measure.

Oleum Æthereum,—was obtained by continuing to heat the mixture of sulphuric acid and alcohol after the preparation of æther sulphuricus. The process was unproductive, and a separate operation is now performed for obtaining it.

Liquor Ammoniæ.—At least fifty measures of a mixed solution of ammonia and chloride of calcium were subjected to distillation in order to procure

twelve measures of product. In the present Pharmacopœia the same quantity is obtained by heating only 32 measures of the mixed solution.

Ammoniæ Sesquicarbonas.—This, which is a supersalt, was called *sub*carbonate; prepared chalk was used instead of chalk merely powdered; a retort, which is a vessel used for distillation, was employed for sublimation. The nature of the vessel is now left to the discretion of the operator.

Liquor Ammoniæ Sesquicarbonatis.—The water ordered was not sufficient to dissolve the salt.

Liquor Ammoniæ Acetatis.—The order of mixing was inconvenient, and the proportions of the ammoniacal salt and distilled vinegar were not well adjusted. The quantity of sesquicarbonate of ammonia is not now positively, but conditionally, ordered.

Oxymel.—The long-continued ebullition increased the empyreumatic flavour of the distilled vinegar, and the preparation was disagreeable.

Antimonii Oxysulphuretum.—The former name of this preparation was inconsistent with the present state of chemical science. Four times as much sesquisulphuret of antimony was directed to be used as the solution of potash was capable of dissolving.

Antimonii Potassio-tartras.—Glass of Antimony was employed; this it was often difficult to procure, and frequently glass of lead was mixed with, and sometimes entirely substituted for it. The present process is economical and easy of execution.

Argenti Nitras.—One-third of the nitric acid directed was in excess.

Arsenicum Album Sublimatum.—The directions for this useless operation are now omitted.

Liquor Potassæ Arsenitis.—The name now adopted is more correct than the former. The directions for using the arsenious acid in powder are omitted, and the use of small pieces is substituted ; this is done for the purpose of securing the purity of this substance, for what is purchased in powder is very commonly adulterated. The use of carbonate of potash prepared by the decomposition of bitartrate of potash was unnecessary. The arsenious acid and carbonate of potash are now ordered to be boiled in only half the quantity of water eventually directed, in order that a glass vessel of moderate size, such for example as a Florence flask, may be used.

Bismuthi Trisnitras.—The name now bestowed upon this preparation denotes its composition.

Calcii Chloridum,—called Calcis Murias, was directed to be prepared from the residue of the sublimation of sesquicarbonate of ammonia ; this being an operation which but few persons carry on, the chloride is now prepared by more direct means.

Liquor Calcii Chloridi, formerly Liquor Calcis Muriatis, was so strong, that in cold weather it crystallized.

Ferri Sulphas.—The quantity of sulphuric acid directed was too small, in the proportion of nearly 8 to 14·3.

Ferri Sesquioxydum, called Ferri Subcarbonas, was however generally, what it is now termed,

merely sesquioxide of iron. The quantity of carbonate of soda was too small, in the proportion of 6 to 8·3.

Ferri Potassio-tartras, a more correct name for the Ferrum Tartarizatum. The mode of preparation is greatly improved, so that it is now readily and totally soluble in water, and perfectly neutral.

Ferri Ammonio-chloridum, a name more accurately descriptive of the nature of this preparation than the former one of Ferrum Ammoniatum; but little more than one-third of the sesquioxide of iron was dissolved by the hydrochloric acid, and the sublimation directed was difficult of performance, and uncertain in its results.

Hydrargyri Bichloridum, formerly Hydrargyri Oxymurias. The present name accurately denotes the composition of this substance. The quantity of sulphuric acid has been advantageously increased, and that of the chloride of sodium as properly diminished.

Liquor Hydrargyri Bichloridi.—The Liquor Hydrargyri Oxymuriatis of the late Pharmacopœia. A dilute solution of hydrochlorate of ammonia is now advantageously employed as a solvent for the mercurial salt instead of a mixture of water and spirit of wine. A deposit was formed in the solution, apparently from the decomposition of the bichloride.

Hydrargyri Chloridum, the correct name of the Hydrargyri Submurias. The quantities of the several ingredients are proportional to those employed in preparing the Hydrargyri Bichloridum, which they

were not in the late Pharmacopœia. The use of hydrochlorate of ammonia formerly directed, and which converted a portion of the chloride into bichloride of mercury, is now properly omitted.

Hydrargyri Ammonio-chloridum, the more correct name of the Hydrargyri Præcipitatum Album. The substitution of solution of ammonia for the carbonate, formed by using hydrochlorate of ammonia and carbonate of potash, is a more simple, and at least as economical a process.

Hydrargyri Oxydum, the correct appellation of the Hydrargyri Oxydum Cinereum. The process is improved by omitting the ebullition formerly employed.

Hydrargyri Binoxydum, the Hydrargyri Oxydum Rubrum. It was prepared by the slow process of oxidizement by the action of heat and air upon mercury. By the present method it is obtained with great facility and economy, and of perfect purity.

Magnesiæ Carbonas, the more correct name of the Magnesiæ Subcarbonas. It was prepared by using nearly one-eighth too much carbonate of potash, and for this carbonate of soda is now economically substituted.

Plumbi Acetas, was prepared by dissolving carbonate of lead in acetic acid; instead of this, oxide of lead is now advantageously directed, which is the plan generally adopted.

Plumbi Diacetas, formerly subacetate of lead. The present name denotes its constitution. It is now much more economically prepared, and more likely to be of uniform strength than before.

Potassæ Carbonas, the correct name of the Potassæ Subcarbonas. The mode of preparation is improved by using less water for the solution of the impure salt, and by employing it cold instead of boiling. By these alterations less of the impurity, but the whole of the carbonate of potash, is dissolved.

Potassæ Acetas.—The quantities of acetic acid and carbonate of potash were incorrectly assigned, for only about $\frac{26}{32}$ of the acetic acid was required. The mode of separating the acetate of potash formed, if indeed practicable, must have been extremely inconvenient.

Potassæ Sulphas.—The excess of sulphuric acid is now directed, and economically so, to be expelled by heat, instead of, as formerly, saturated by the addition of carbonate of potash. That carbonate of potash is of more value than the sulphate, is proved by the fact, that manufactories are carried on for converting the sulphate into carbonate.

Potassæ Bisulphas, the correct name of the Potassæ Supersulphas. This preparation is rendered much more certain by the addition of sulphuric acid to the solution of the bisulphate of potash. According to the former directions, variable mixtures of sulphate, sesquisulphate, and bisulphate of potash were obtained.

Sodæ Carbonas, formerly Sodæ Subcarbonas. It is now intended that instead of the very impure carbonate of soda formerly used, and imported from Spain under the name of *barilla*, a much purer,

though still not quite pure, carbonate of home manufacture should be employed.

Sodæ Carbonas Exsiccata.—The present directions are such as will yield anhydrous carbonate of soda, and consequently it will be of uniform strength. The former directions were not such as to ensure this degree of uniformity.

Sodæ Potassio-tartras.—This name expresses the nature of the salt. The proportions of bitartrate of potash and carbonate of soda are more correctly adjusted than in the late Pharmacopœia.

Zinci Sulphas.—The quantity of water with which the sulphuric acid was diluted is much and advantageously diminished.

Zinci Oxydum.—The former preparation was a subsulphate and not a pure oxide of zinc.

Alcohol.—This is much more conveniently prepared by using chloride of calcium, than the carbonate of potash formerly employed. The process is also at least as economical.

Spiritus Ammoniæ and *Spiritus Ammoniæ Aromaticus.*—The modes of preparing these are rendered as similar as the established difference of strength would admit of; the proportions of hydrochlorate of ammonia and carbonate of potash being correctly adjusted.

Spiritus Ammoniæ Fœtidus.—This process has been much economized. Formerly Spiritus Ammoniæ was first separately obtained, and then re-distilled with assafœtida. One operation only is now employed.

ADVERTISEMENT TO THE THIRD EDITION.

In the present edition I have made some alterations, sanctioned by general use, in the mode of employing the letters and symbols, proposed originally by Berzelius and adopted by Turner, to designate chemical bodies.

Two lists are given, in the first of which the elements, and in the second the letters by which they are expressed, are alphabetically arranged; by these the student will be enabled readily to find or to explain a symbol: and to render this part of the subject as clear as I am able, I have also given an explanation of the mode of employing symbols, and I have added a table of chemical equivalents, which contains every definite chemical substance in the Pharmacopœia, and also many others which do not occur in it.

R. P.

St. Thomas's Hospital,
May 1838.

ADVERTISEMENT TO THE FOURTH EDITION.

I have, in this edition, corrected several and added some analyses required by the rapid progress of organic chemistry; and I have also given a few pages of new matter, which will, I trust, increase the utility of the work.

I cannot avoid expressing the great obligation I am under to the very elaborate and excellent work on Materia Medica, recently published by my friend Dr. Pereira; this I am the more anxious now to do, because I have availed myself of information obtained from him, on more occasions than I have acknowledged in the body of the Translation.

R. P.

Craig's Court, Charing Cross,
February 1841.

CONTENTS.

THE

LONDON PHARMACOPŒIA.

WEIGHTS, MEASURES, ETC.

TWO kinds of weights are used in England; by one of which gold and silver, and by the other nearly all other kinds of merchandise are valued: we employ the former, which is also called TROY WEIGHT; and we divide the pound thus, viz.

The Pound	℔	contains	Twelve Ounces, ℥ xij.
— Ounce	℥	contains	Eight Drachms, ʒ viij.
— Drachm	ʒ	contains	Three Scruples, ℈ iij.
— Scruple	℈	contains	Twenty Grains, gr. xx.
— Grain	gr.		

We have added the signs by which each weight is usually denoted.

We use measures of liquids derived from the gallon defined by the laws of the kingdom: this for medicinal purposes we divide thus, viz.

The Gallon	C	contains	Eight Pints, Oviij.
— Pint	O	contains	Twenty Fluidounces, f℥ xx.
— Fluidounce	f℥	contains	Eight Fluidrachms, fʒ viij.
— Fluidrachm	fʒ	contains	Sixty Minims, ♏ lx.
— Minim	♏		

We have added the signs by which we denote each measure.

Care is to be taken that medicines do not acquire any impurity from the material of the vessels in which they are either prepared or kept.

All acid, alkaline, or metallic preparations, and salts of every kind, ought to be kept in stopped glass bottles. With some preparations it is proper that they should be of black or green glass.

Wherever the saturation of acids or alkalis is mentioned, we direct it to be ascertained whether it be perfect or not, by means of litmus and turmeric, in the mode adopted by chemists. Unless it be otherwise ordered, bibulous paper is to be used in straining liquors and in drying crystals.

We measure the degree of heat by *Fahrenheit's* thermometer; and when we direct a BOILING HEAT, we mean that of 212°. But we call a GENTLE HEAT, that which is denoted by any degree between 90° and 100°.

Whenever SPECIFIC GRAVITY is mentioned, we suppose the substance treated of to be of the temperature of 62°.

When CRUCIBLES are required, we direct those to be employed which are Hessian or Cornish.

A WATER BATH is that by which any substance contained in a proper vessel is exposed either to hot water, or the vapour of boiling water.

A SAND BATH is made of sand, to be gradually heated, in which anything is placed, contained in a proper vessel.

TROY OR APOTHECARIES WEIGHT.

Pound.		Ounces.		Drachms.		Scruples.		Grains.
1	=	12	=	96	=	288	=	5760
		1	=	8	=	24	=	480
				1	=	3	=	60
						1	=	20

AVOIRDUPOIS WEIGHT.

Pound.		Ounces.		Drachms.		Grains.
1	=	16	=	256	=	7000
		1	=	16	=	437·5
				1	=	27·34375

IMPERIAL MEASURE.

Gallon.		Pints.		Fluidounces.		Fluidrachms.		Minims.
1	=	8	=	160	=	1280	=	76800
		1	=	20	=	160	=	9600
				1	=	8	=	480
						1	=	60

Weight of water at 62°. Avoir.	lbs.	oz.	Grains.	Cubic inches.
Imperial Gallon . . =	10	0 =	70000	=277·273843570
Imperial Pint . . . =	1	4 =	8750	= 34·659230446
Imperial Fluidounce =		1 =	437·5	= 1·732961522
Imperial Fluidrachm =			54·7	= 0·216620190
Imperial Minim . . . =			·91	= 0·003610335

Former Pharmacopoeias.

WINE MEASURE.

Gallon.		Pints.		Fluidounces.		Fluidrachms.		Minims.
1	=	8	=	128	=	1024	=	61440
		1	=	16	=	128	=	7680
				1	=	8	=	480
						1	=	60

Weight of water at 62°. Avoir.	lbs.	oz.	grs.		Grains.	Cubic inches.
Wine Gallon . . . =	8	$5\frac{1}{4}$	21	=	58318	=231
Wine Pint . . . . =	1	$0\frac{1}{2}$	71	=	7290	= 28·875
Wine Fluidounce. =		1	18	=	455·6	= 1·805
Wine Fluidrachm. =					57	= 0·226
Wine Minim . . . =					·95	= 0·004

IMPERIAL compared with WINE MEASURE.

	Gallon.	Pints.	Fluidounces.	Fluidrachms.	Minims.
Gallon. . . . =	1	1	9	5	8
Pint . . . . . =		1	3	1	38
Fluidounce . =				7	41
Fluidrachm . =					58
Minim. . . . =					0·96

WINE compared with IMPERIAL MEASURE.

	Pints.	Fluidounces.	Fluidrachms.	Minims.
Gallon . . . . . =	6	13	2	22
Pint . . . . =		16	5	18
Fluidounce. . . =		1	0	20
Fluidrachm . . =			1	2·5
Minim . . . . . =				1·04

One cubic inch of Water at 62° F. weighs 252·458 grains.

In this table, except in particular instances, fractions of a grain or of a minim, greater than half, are reckoned as one, and omitted when less.

MATERIA MEDICA.

In the first column the names of substances are generally short, simple, and better suited for prescriptions; but in the other, Vegetables are named according to Willdenow's edition of the *Species Plantarum* of Linnæus, or De Candolle's edition of the *Prodromus Systematis Naturalis*; Animals, according to *Le Règne Animal,* enlarged by Cuvier, unless it be otherwise stated; Chemical Substances are described by modern names.

Abietis Resina, *Resin of the Spruce Fir.*	Pinus Abies, *The Resin.*
Absinthium, *Common Wormwood.*	Artemisia Absinthium.
Acacia, *Acacia.*	Acacia vera, *The Gum.*
Acetosella, *Woodsorrel.*	Oxalis Acetosella.
Acetum, *Vinegar.*	Acetum, *Prepared by fermentation.*
Acidum Arseniosum, *Arsenious Acid.*	Acidum Arseniosum, *Prepared by sublimation.*
Acidum Sulphuricum, *Sulphuric Acid.*	Acidum Sulphuricum, *Its specific gravity is* 1·845.
Aconiti Folia, *Leaves of Aconite.*	Aconitum paniculatum (De Candolle), *The Leaves.*
Aconiti Radix, *Root of Aconite.*	*The Root.*
Acorus, *Sweet Flag.*	Acorus Calamus, *The Rootstock.*

Adeps, *Hog's Lard.*	Sus Scrofa, *The prepared Lard.*
Ærugo, *Verdigris.*	Diacetas Cupri impura, *Impure Diacetate of Copper.*
Allium, *Garlic.*	Allium sativum, *The Bulb.*
Alöe, *Aloes.*	Alöe spicata, *The inspissated Juice of the Leaves.*
Althææ Folia, *Leaves of the Marshmallow.*	Althæa officinalis, *The Leaves.*
Althææ Radix, *Root of the Marshmallow.*	*The Root.*
Alumen, *Alum.*	Sulphas Aluminæ et Potassæ, *Sulphate of Alumina and Potash.*
Ammoniacum, *Ammoniacum.*	Dorema Ammoniacum (Don, *in Act. Soc. Linn.*), *The Gum-resin.*
Ammoniæ Hydrochloras, *Hydrochlorate of Ammonia.*	
Ammoniæ Liquor fortior, *Stronger Solution of Ammonia.*	Ammoniæ Liquor fortior, *Its specific gravity is ·882.*
Amygdala amara, *Bitter Almond.*	Amygdalus communis (De Candolle), Var. α. *The Kernels.*
Amygdala dulcis, *Sweet Almond.*	Var. β. *The Kernels.*
Amygdalæ Oleum, *Oil of Almond.*	*The Oil expressed from either of the Kernels.*
Amylum, *Starch.*	Triticum hybernum, *The Fæcula of the Seeds.*
Anethum, *Dill.*	Anethum graveolens, *The Fruit.*

Anisum, *Anise.*	Pimpinella Anisum, *The Fruit.*
Anthemis, *Chamomile.*	Anthemis nobilis, *The single Flowers.*
Antimonii Sesquisulphuretum, *Sesquisulphuret of Antimony.*	
Argentum, *Silver.*	
Armoracia, *Horseradish.*	Cochlearia Armoracia, *The fresh Root.*
Asarum, *Asarabacca.*	Asarum europæum, *The Leaves.*
Aspidium, *Male Fern.*	Aspidium Filix mas (SMITH, *Flor. Brit.*), *The Root.*
Assafœtida, *Assafœtida.*	Ferula Assafœtida, *The Gum-resin.*
Avena, *Oat.*	Avena sativa, *The Seeds freed from the husks.*
Aurantium, *Orange.*	Citrus Aurantium (DE CANDOLLE), *The Fruit.*
Aurantii Cortex, *Orange Peel.*	Citrus vulgaris (DE CANDOLLE), *The outer Rind of the Fruit.*
Aurantii Flores, *Flowers of the Orange.*	Citrus Aurantium (DE CANDOLLE), *The Flowers.*
Aurantii Oleum, *Oil of Orange.*	*The Oil distilled from the Flowers.*
Balsamum Peruvianum, *Peruvian Balsam.*	Myroxolon peruiferum, *The liquid Balsam.*
Balsamum Tolutanum, *Tolu Balsam.*	*The solid Balsam.*

Barytæ Carbonas, *Carbonate of Barytes.*	
Belladonna, *Deadly Nightshade.*	Atropa Belladonna, *The Leaves.*
Benzöinum, *Benzoin.*	Styrax Benzoin, *The Balsam.*
Bergamii Oleum, *Oil of Bergamot.*	Citrus Limetta Bergamium (De Candolle), *The Oil distilled from the Rind of the Fruit.*
Bismuthum, *Bismuth.*	
Borax, *Borax.*	Sodæ Biboras, *Biborate of Soda.*
Brominium, *Bromine.*	
Cajuputi, *Cajuput.*	Melaleuca minor, *The Oil distilled from the Leaves.*
Calamina, *Calamine.*	Carbonas Zinci impura, *Impure Carbonate of Zinc.*
Calcis Hydras, *Hydrate of Lime.*	*Fresh-burnt Lime slacked with Water.*
Calx, *Lime.*	Calx récens usta, *Fresh-burnt Lime.*
Calumba, *Calumba.*	Cocculus palmatus (De Candolle), *The Root.*
Cambogia, *Gamboge.*	Stalagmitis Cambogiöides, *The Gum-resin.*
Camphora, *Camphor.*	Laurus Camphora, *A peculiar Concrete, purified by sublimation.*
Canella, *Canella.*	Canella alba, *The Bark.*
Cantharis, *Cantharis.*	Cantharis vesicatoria.

Capsicum, *Capsicum, (Cayenne Pepper.)*	Capsicum annuum, *The Berries.*
Carbo Animalis, *Animal Charcoal.*	Carbo, *Prepared from Flesh and Bones.*
Carbo Ligni, *Wood Charcoal.*	Carbo, *Prepared from Wood.*
Cardamine, *Cuckoo Flower.*	Cardamine pratensis, *The Flowers.*
Cardamomum, *Cardamom.*	Alpinia Cardamomum (Roxburgh, *Plant. Corom.*), *The Seeds.*
Carui, *Caraway.*	Carum Carui, *The Fruit.*
Caryophyllus, *Clove.*	Caryophyllus aromaticus (De Candolle), *The dried Buds.*
Caryophylli Oleum, *Oil of Clove.*	*The Oil distilled from the Flowers.*
Cascarilla, *Cascarilla.*	Croton Cascarilla (Don, *Ed. Ph. Journ.*), *The Bark.*
Cassia, *Cassia.*	Cassia Fistula, *The Pulp of the Pods.*
Castoreum, *Castor.*	Castor Fiber, *A Concrete found in the follicles of the prepuce.*
Catechu, *Catechu.*	Acacia Catechu, *Extract of the Wood.*
Centaurium, *Centaury.*	Erythræa Centaurium (Persoon, *Syn. Plant.*).
Cera, *Wax.*	Apis mellifica, *A Concrete prepared by the Bee.*
Cera alba, *White Wax.*	*The same bleached.*
Cerevisiæ Fermentum, *Yest.*	

Cetaceum, *Spermaceti.*	Physeter macrocephalus, *A Concrete found in peculiar cells of the head.*
Cetraria, *Liverwort.*	Cetraria islandica, (ACHAR., *Lichenog. Univ.*).
Chimaphila, *Winter Green, or Pyrola.*	Chimaphila corymbosa (PURSH, *Flora Amer. Sept.*), *The Leaves.*
Cinchona cordifolia, *Heart-leaved Cinchona, (Yellow Bark.)*	Cinchona cordifolia (LAMBERT, *Cinch.*), *The Bark.*
Cinchona lancifolia, *Lance-leaved Cinchona, (Pale or Quill Bark.)*	Cinchona lancifolia (LAMBERT, *Cinch.*), *The Bark.*
Cinchona oblongifolia, *Oblong-leaved Cinchona, (Red Bark.)*	Cinchona oblongifolia (LAMBERT, *Cinch.*), *The Bark.*
Cinnamomi Oleum, *Oil of Cinnamon.*	Laurus Cinnamomum, *The Oil distilled from the Bark.*
Cinnamomum, *Cinnamon.*	*The Bark.*
Cocci, *Cochineal.*	Coccus Cacti.
Colchici Cormus, *Cormus of Meadow Saffron.*	Colchicum autumnale, *The Cormus.*
Colchici Semina, *Seeds of Meadow Saffron.*	*The Seeds.*
Colocynthis, *Colocynth.*	Cucumis Colocynthis, *The dried Pulp of the Fruit.*
Conii Folia, *Leaves of Hemlock.*	Conium maculatum, *The Leaves.*
Conii Fructus, *Fruit of Hemlock.*	*The Fruit.*
Contrajerva, *Contrayerva.*	Dorstenia Contrajerva, *The Root.*

Copaiba, *Copaiva.*	Copaifera Langsdorfii (De Candolle), *The liquid Resin.*
Coriandrum, *Coriander.*	Coriandrum sativum, *The Fruit.*
Cornu, *Horn.*	Cervus Elaphus, *The Horn.*
Creasoton, *Creasote.*	Oxy-hydro-carburetum, *An oxyhydrocarburet, prepared from pyroxylic Oil.*
Creta, *Chalk.*	Calcis Carbonas (*friabilis*), *Carbonate of Lime (friable).*
Crocus, *Saffron.*	Crocus sativus, *The dried Stigmata.*
Cupri Sulphas, *Sulphate of Copper.*	
Curcuma, *Turmeric.*	Curcuma longa, *The Rootstock.*
Cusparia, *Cusparia,* or *Angustura Bark.*	Galipea Cusparia (De Candolle), *The Bark.*
Cydonia, *Quince.*	Cydonia vulgaris (De Candolle), *The Seeds.*
Cyminum, *Cummin.*	Cuminum Cyminum, *The Fruit.*
Dauci Fructus, *Fruit of the Carrot.*	Daucus Carota, *The Fruit.*
Dauci Radix, *Root of the Carrot.*	Daucus Carota, *The fresh Root.*
Digitalis Folia, *Leaves of Foxglove.*	Digitalis purpurea, *The Leaves.*
Digitalis Semina, *Seeds of Foxglove.*	*The Seeds.*
Diosma, *Buchu.*	Diosma crenata, *The Leaves.*
Dulcamara, *Woody Nightshade.*	Solanum Dulcamara, *The Stalk.*

Elaterium, *Wild Cucumber.*	Momordica Elaterium, *The fresh Fruit.*
Elemi, *Elemi.*	Amyris elemifera, *The Resin.*
Ergota, *Ergot.*	Acinula Clavus (FRIES, *Syst. Mycol.*).
Euphorbium, *Euphorbium.*	Euphorbia officinarum, *The Gum-resin.*
Farina, *Flour.*	Triticum hybernum, *The Flour of the Seeds.*
Ferri Percyanidum, *Percyanide of Iron, (Prussian Blue.)*	
Ferrum, *Iron.*	Ferrum, *The Filings.*
Fici, *Figs.*	Ficus Carica, *The dried Fruit.*
Fœniculum, *Fennel.*	Fœniculum vulgare (DE CANDOLLE), *The Fruit.*
Galbanum, *Galbanum.*	Galbanum officinale (DON, *in Act. Soc. Linn.*), *The Gum-resin.*
Gallæ, *Galls.*	Quercus infectoria, *The diseased Buds.*
Gentiana, *Gentian.*	Gentiana lutea, *The Root.*
Glycyrrhiza, *Liquorice.*	Glycyrrhiza glabra, *The fresh Root.*
Granatum, *Pomegranate.*	Punica Granatum, *The Rind of the Fruit*
Guaiaci Lignum, *Guaiacum Wood.*	Guaiacum officinale, *The Wood.*
Guaiaci Resina, *Resin of Guaiacum.*	*The Resin.*
Hæmatoxylum, *Logwood.*	Hæmatoxylon campechianum, *The Wood.*

Helleborus, *Hellebore.*	Helleborus officinalis (SIBTHORP, *Flora Græca*), *The Root.*
Hirudo, *The Leech.*	Hirudo medicinalis.
Hordeum, *Barley.*	Hordeum distichon, *The Seeds freed from the husks*, (*Pearl Barley.*)
Hydrargyrum, *Quicksilver*, (*Mercury.*)	
Hyoscyami Folia, *Leaves of Henbane.*	Hyoscyamus niger, *The Leaves.*
Hyoscyami Semina, *Seeds of Henbane.*	*The Seeds.*
Jalapa, *Jalap.*	Ipomæa Jalapa (DON, *MS.*), *The Root.*
Inula, *Elecampane.*	Inula Helenium, *The Root.*
Iodinium, *Iodine.*	
Ipecacuanha, *Ipecacuanha.*	Cephaelis Ipecacuanha (DE CANDOLLE), *The Root.*
Juniperi Cacumina, *Tops of the Juniper.*	Juniperus communis, *The Tops.*
Juniperi Fructus, *Fruit of the Juniper.*	*The Fruit.*
Kino, *Kino.*	Pterocarpus erinaceus (DE CANDOLLE), *The Extract.*
Krameria, *Rhatany.*	Krameria triandra (DE CANDOLLE), *The Root.*
Lacmus, *Litmus.*	Roccella tinctoria (ACHAR., *Lichenog. Univ.*), *The prepared Thallus.*
Lactucarium, *Lactucarium.*	Lactuca sativa, *The inspissated Juice.*

Lavandula, *Lavender.*	Lavandula Spica, *The Flowers.*
Lauri Baccæ, *Bay Berries.*	Laurus nobilis, *The Berries.*
Lauri Folia, *Bay Leaves.*	*The Leaves.*
Limones, *Lemons.*	Citrus Limonum (De Candolle), *The Fruit.*
Limonum Cortex, *Lemon Peel.*	*The external Rind of the Fruit.*
Limonum Oleum, *Oil of Lemons.*	*The Oil distilled from the external Rind of the Fruit.*
Limonum Succus, *Juice of Lemons.*	*The Juice.*
Lini Oleum, *Oil of Linseed.*	Linum usitatissimum, *The Oil expressed from the Seeds.*
Lini Semina, *Linseed.*	*The Seeds.*
Lobelia, *Indian Tobacco.*	Lobelia inflata.
Lupulus, *Hop.*	Humulus Lupulus, *The dried Strobiles.*
Magnesiæ Sulphas, *Sulphate of Magnesia.*	
Malva, *Mallow.*	Malva sylvestris.
Manganesii Binoxydum, *Binoxide of Manganese.*	
Manna, *Manna.*	Ornus europæa, *The concrete Juice.*
Maranta, *Arrow-root.*	Maranta arundinacea, *The Fæcula of the Root-stock.*
Marmor, *Marble.*	*Carbonate of Lime (hard).*

Marrubium, *White Horehound.*	Marrubium vulgare.
Mastiche, *Mastich.*	Pistacia Lentiscus, *The Resin.*
Mel, *Honey.*	Apis mellifica, *Juice extracted from Flowers, and prepared by the Bee.*
Mentha piperita, *Peppermint.*	Mentha piperita (Smith, *in Act. Soc. Linn.*).
Mentha Pulegium, *Pennyroyal.*	Mentha Pulegium.
Mentha viridis, *Spearmint.*	Mentha viridis.
Menyanthes, *Buckbean.*	Menyanthes trifoliata.
Mezereum, *Mezereon.*	Daphne Mezereum, *The Bark of the Root.*
Mora, *Mulberries.*	Morus nigra, *The Fruit.*
Moschus, *Musk.*	Moschus moschiferus, *Juice secreted in the follicle of the prepuce.*
Mucuna, *Cowhage.*	Mucuna pruriens (De Candolle), *The Bristles of the Pods.*
Myristica, *Nutmeg.*	Myristica moschata, *The Nuts.*
Myristicæ Oleum, *Oil of Nutmeg.*	*The Oil distilled from the Nuts.*
Myrrha, *Myrrh.*	Balsamodendron Myrrha (Ehrenberg), *The Gum-resin.*
Nux vomica, *Nux vomica.*	Strychnos Nux vomica, *The Seeds.*
Olibanum, *Olibanum.*	Boswellia serrata (Colebr., *in Act. Soc. As.*), *The Gum-resin.*

Olivæ Oleum, *Olive Oil.*	Olea europæa, *The Oil expressed from the Fruit.*
Opium, *Opium.*	Papaver somniferum, *The concrete Juice of the unripe Capsules.*
Opopanax, *Opopanax.*	Opopanax Chironium (De Candolle), *The Gum-resin.*
Origanum, *Marjoram.*	Origanum vulgare.
Ovum, *Egg.*	Phasianus Gallus, *The Egg.*
Papaver, *Poppy.*	Papaver somniferum, *The ripe Capsules.*
Pareira, *Pareira.*	Cissampelos Pareira (De Candolle), *The Root.*
Petroleum, *Petroleum.*	Petroleum (*Barbadense*).
Phosphorus, *Phosphorus.*	
Pimenta, *Pimenta.*	Myrtus Pimenta, *The dried unripe Berries.*
Piper Cubeba, *Cubebs.*	Piper Cubeba, *The Berries.*
Piper longum, *Long Pepper.*	Piper longum, *The dried unripe Fruit.*
Piper nigrum, *Black Pepper.*	Piper nigrum, *The Berries.*
Pix abietina, *Burgundy Pitch.*	Pinus Abies, *The prepared Resin.*
Pix liquida, *Tar.*	Pinus sylvestris, *The prepared liquid Resin.*
Pix nigra, *Black Pitch.*	*The prepared solid Resin.*
Plumbi Carbonas, *Carbonate of Lead.*	
Plumbi Oxydum, *Oxide of Lead.*	Plumbi Oxydum (*semivitreum*).

Porrum, *Leek.*	Allium Porrum, *The Bulb.*
Potassæ Bitartras, *Bitartrate of Potash.*	
Potassæ Carbonas impura, *Impure Carbonate of Potash.*	
Potassæ Chloras, *Chlorate of Potash.*	
Potassæ Nitras, *Nitrate of Potash.*	
Potassii Ferrocyanidum, *Ferrocyanide of Potassium.*	
Pruna, *Prunes.*	Prunus domestica, *The [Pulp of the] dried Fruit.*
Pterocarpus, *Red Saunders.*	Pterocarpus santalinus, *The Wood.*
Pyrethrum, *Pellitory of Spain.*	Anthemis Pyrethrum, *The Root.*
Quassia, *Quassia.*	Quassia excelsa, *The Wood.*
Quercus, *Oak.*	Quercus pedunculata, *The Bark.*
Quina, *Quina.*	Cinchona cordifolia, *The Alkali prepared from the Bark.*
Resina, *Resin.*	Pinus sylvestris, *The residue of Turpentine after the Oil is distilled.*
Rhamnus, *Buckthorn.*	Rhamnus catharticus, *The Berries.*
Rheum, *Rhubarb.*	Rheum palmatum, *The Root.*
Rhœas, *Red Poppy.*	Papaver Rhœas, *The Petals.*
Ricini Oleum, *Castor Oil.*	Ricinus communis, *The Oil expressed from the Seeds.*

Rosa canina, *Dog Rose.*	Rosa canina, *The Pulp of the Fruit.*
Rosa centifolia, *Damask Rose.*	Rosa centifolia, *The Petals.*
Rosa gallica, *Red Rose.*	Rosa gallica, *The Petals.*
Rosmarinus, *Rosemary.*	Rosmarinus officinalis, *The Tops.*
Rumex, *Sorrel.*	Rumex Acetosa, *The Leaves.*
Ruta, *Rue.*	Ruta graveolens, *The Leaves.*
Sabadilla, *Cevadilla.*	Helonias officinalis (Don, *Ed. Ph. Journ.*), *The Seeds.*
Sabina, *Savine.*	Juniperus Sabina, *The fresh and dried Tops.*
Sacchari fæx, *Treacle.*	Saccharum officinale, *The prepared Juice.*
Saccharum, *Sugar.*	
Sagapenum, *Sagapenum.*	*An uncertain species of Ferula. The Gum-resin.*
Sago, *Sago.*	Sagus Rumphii, *The Fæcula of the Pith.*
Sambucus, *Elder.*	Sambucus nigra, *The Flowers.*
Sapo, *Soap.*	Soap, *made of Olive Oil and Soda.*
Sapo mollis, *Soft Soap.*	Soap, *made of Olive Oil and Potash.*
Sarza, *Sarsaparilla.*	Smilax officinalis (Humboldt *and* Bonpland, *Nov. Gen. et Spec. Plant.*), *The Root.*
Sassafras, *Sassafras.*	Laurus Sassafras, *The Root.*

Scammonium, *Scammony.*	Convolvulus Scammonea, *The Gum-resin.*
Scilla, *Squill.*	Scilla maritima, *The fresh Bulb.*
Scoparius, *Broom.*	Cytisus Scoparius (De Candolle), *The fresh Tops.*
Senega, *Senega.*	Polygala Senega, *The Root.*
Senna, *Senna.*	Cassia lanceolata (De Candolle), *The Leaves.* Cassia obovata (De Candolle), *The Leaves.*
Serpentaria, *Serpentary.*	Aristolochia Serpentaria, *The Root.*
Sevum, *Suet.*	Ovis Aries, *The Suet.*
Simaruba, *Simaruba.*	Simaruba officinalis (De Candolle), *The Bark of the Root.*
Sinapis, *Mustard.*	Sinapis nigra, *The Seeds.*
Sodæ Acetas, *Acetate of Soda.*	
Sodæ Carbonas impura, *Impure Carbonate of Soda.*	
Sodæ Phosphas, *Phosphate of Soda.*	
Sodii Chloridum, *Chloride of Sodium.*	
Spigelia, *Indian Pink.*	Spigelia marilandica, *The Root.*
Spiritus rectificatus, *Rectified Spirit.*	Spiritus, *Its specific gravity is* ·838.
Spiritus tenuior, *Proof Spirit.*	Spiritus, *Its specific gravity is* ·920.
Spiritus Vini Gallici, *Spirit of French Wine,* (*Brandy.*)	Spiritus, *Distilled from French Wine.*

Stannum, *Tin.*	
Staphisagria, *Stavesacre.*	Delphinium Staphisagria, *The Seeds.*
Stramonii Folia, *Leaves of Thorn Apple.*	Datura Stramonium, *The Leaves.*
Stramonii Semina, *Seeds of Thorn Apple.*	*The Seeds.*
Styrax, *Storax.*	Styrax officinale, *The Balsam.*
Succinum, *Amber.*	
Sulphur, *Sulphur.*	Sulphur (*sublimatum*).
Tabacum, *Tobacco.*	Nicotiana Tabacum, *The dried Leaves.*
Tamarindus, *Tamarind.*	Tamarindus indica, *The Pulp.*
Taraxacum, *Dandelion.*	Leontodon Taraxacum, *The Root.*
Terebinthina Canadensis, *Canadian Turpentine.*	Pinus Balsamea, *The liquid Resin.*
Terebinthina Chia, *Chio Turpentine.*	Pistacia Terebinthus, *The liquid Resin.*
Terebinthina vulgaris, *Common Turpentine.*	Pinus sylvestris, *The liquid Resin.*
Terebinthinæ Oleum, *Oil of Turpentine.*	*The Oil distilled from the Resin.*
Testæ, *Shells.*	Ostrea edulis, *The Shells.*
Tiglii Oleum, *Oil of Croton.*	Croton Tiglium, *The Oil expressed from the Seeds.*
Tormentilla, *Tormentil.*	Potentilla Tormentilla (De Candolle), *The Root.*
Toxicodendron, *Sumach.*	Rhus Toxicodendron, *The Leaves.*

Tragacantha, *Tragacanth.*	Astragalus verus (Olivier, *Voy. dans l'Emp. Ottom.*), *The Concrete Juice.*
Tussilago, *Coltsfoot.*	Tussilago Farfara.
Valeriana, *Valerian.*	Valeriana officinalis (*sylvestris*), *The Root.*
Veratrum, *White Hellebore.*	Veratrum album, *The Root.*
Vinum Xericum, *Sherry Wine.*	
Ulmus, *Elm.*	Ulmus campestris, *The Bark.*
Uva, *Raisins.*	Vitis vinifera, *The dried Berries with the stones taken out.*
Uva ursi, *Whortleberry.*	Arctostaphylos Uva ursi (Sprengel, *Syst. Veget.*), *The Leaves.*
Zincum, *Zinc.*	
Zingiber, *Ginger.*	Zingiber officinalis (Roscoe, *in Act. Soc. Linn.*), *The Rootstock.*

NOTES.

It has been deemed proper to add short notes, relating chiefly to the chemical preparations, by which their purity may, as nearly as possible, be ascertained. This, for the most part, is less necessary with vegetable and animal substances, and is also attended with more difficulty. For although the peculiar character of each plant and animal is sufficiently defined in books on botany and zoology, yet the extracts from them and the weaker preparations are frequently so much altered in taste, colour, and smell, that they cannot be distinguished by any certain sign, or be briefly described.

Acetum. *Vinegar.*—A yellowish liquor, of a peculiar odour, a fluidounce of which is saturated by a drachm of crystallized carbonate of soda. Solution of chloride of barium being added, the sulphate of barytes precipitated does not exceed 1·14 grain. Hydrosulphuric acid being added, its colour is not altered.

Remarks.—The strongest vinegar contains 5 per cent. of real acetic acid; usually it does not exceed 4·6 per cent.; a fluidounce weighs about 446 grains, saturating, when of the strength last mentioned, 58 grains of carbonate of soda; and two grains of it, making up the drachm, are allowed for saturating the sulphuric acid permitted to be mixed with the vinegar, and for decomposing the sulphates of the water used in vinegar-making: the 1·14 grain of sulphate of barytes is derived from the same sources, and proves that too much sulphuric acid has not been used. The non-action of hydrosulphuric acid demonstrates the absence of most metallic oxides.

Acetum Destillatum. *Distilled Vinegar.*—Totally vaporized by heat. No precipitate is formed on the addition of acetate of lead, nitrate of silver, nor iodide of potassium. Neither hydrosulphuric acid nor ammonia alters its colour. After the digestion of a plate of silver in it, hydrochloric acid occasions no precipitation. Thirteen grains of the crystals of carbonate of soda are saturated by 100 grains of distilled vinegar.

Remarks.—The total evaporation shows that no solid impurity is dissolved in the vinegar. The non-precipitation by acetate of lead proves the absence of sulphuric acid; by nitrate of silver, that of hydrochloric acid; by iodide of potassium, that of lead. The non-action of hydrosulphuric acid proves the absence of metallic admixture in general. The smallest portion of copper is detected by first saturating with ammonia, and the occurrence of a reddish brown tint, and eventually a precipitate of the same colour, on the addition of ferrocyanide of potassium to the solution. If adulterated with nitric acid, silver would be dissolved by digestion in it, and afterwards precipitated as a chloride by hydrochloric acid. The quantity of carbonate of soda to be saturated indicates the presence of 4·6 per cent. of real acetic acid.

Acidum Aceticum. *Acetic Acid.*—The specific gravity of this acid is 1·048. Eighty-seven grains of crystals of carbonate of soda are saturated by 100 grains of this acid. The acid when saturated with carbonate of soda and evaporated, yields crystals of acetate of soda. Other tests agree with those of the preceding preparation.

Remarks.—The saturating power of this acid shows that it contains 30·8 per cent. of real acetic acid.

Acidum Arseniosum. *Arsenious Acid.*—It is entirely sublimed when heated. Mixed with charcoal and exposed to heat, it emits an alliaceous smell. It is dissolved by boiling water; and hydrosulphuric acid, when added, throws down a yellow precipitate, and lime-water yields a white one.

Remarks.—The precipitate thrown down by hydrosulphuric acid is sesquisulphuret of arsenic, and that by lime-water is arsenite of lime.

Acidum Benzöicum. *Benzoic Acid.*—When cautiously heated it totally evaporates with a peculiar odour. It is sparingly soluble in water, but plentifully in rectified spirit. It is entirely dissolved by solution of potash or by lime-water, and is precipitated by hydrochloric acid.

Acidum Citricum (*crystalli*). *Citric Acid* (*crystals*).—This acid is soluble in water; what is precipitated from the solution by acetate of lead, is dissolved by nitric acid. No salt of potash, except the tartrate, is precipitated by solution of citric acid. It is totally dissipated in the fire.

Remarks.—Any precipitate obtained by acetate of lead, which is insoluble in nitric acid, may be regarded as sulphate of lead,

and would denote the presence of sulphuric acid or a sulphate in the citric acid. If the citric acid contain any tartaric acid, that will decompose other salts of potash besides the tartrate, and a crystalline and difficultly soluble precipitate of bitartrate of potash will be formed. As citric acid consists of oxygen, hydrogen and carbon, all of which are dissipated at a red heat, any substance remaining after ignition is an impurity.

Acidum Hydrochloricum. *Hydrochloric Acid.*—Colourless; entirely vaporized by heat. When mixed with distilled water, neither chloride of barium nor ammonia, nor the sesquicarbonate of ammonia throws down anything. Strips of gold, even when heated in it, are not acted upon by it. It does not destroy the colour of solution of sulphate of indigo. Its specific gravity is 1·16. One hundred and thirty-two grains of crystals of carbonate of soda are saturated by 100 grains of this acid.

Remarks.—The total evaporation by heat proves that no fixed substance is dissolved in the acid. The non-action of chloride of barium shows that no sulphuric acid is present, or sulphate of barytes would be precipitated. Ammonia or the sesquicarbonate of ammonia would detect the presence of most metals and earths by precipitating, and, in some cases, by afterwards redissolving them. Gold, even when heated in hydrochloric acid, is not dissolved unless chlorine be present, and then it is taken up, and may be precipitated from the solution by chloride of tin; the precipitate is of a purple or dark colour. If chlorine be present it will also destroy the colour of the solution of indigo. When 100 parts of this acid saturate 132 of carbonate of soda, it contains rather more than 33·9 per cent. of hydrochloric acid gas.

Acidum Hydrocyanicum Dilutum. *Dilute Hydrocyanic Acid.*—Free from colour; goes off in vapour by heat, exhaling its peculiar odour. It turns litmus of a slight fugacious red colour; hydrosulphuric acid, when added, does not discolour it. One hundred grains of this acid, when solution of nitrate of silver is added, precipitate 10 grains of cyanide of silver, which are readily dissolved by boiling nitric acid. If the iodo-cyanide of potassium and mercury when mixed with the hydrocyanic acid be reddened, it contains some other acid. In 100 grains of this diluted acid there are contained 2 grains of real hydrocyanic acid; and to this standard, in whatever mode it is distilled, we direct it should be reduced.

Remarks.—The total evaporation of the hydrocyanic acid shows the absence of fixed impurity. If it redden litmus-paper

strongly and permanently, then some other acid is mixed with it: the absence of most metallic salts is denoted by the non-action of hydrosulphuric acid. If the hydrocyanic acid contain hydrochloric acid, then the precipitate formed by nitrate of silver, being chloride of silver, is insoluble in the nitric acid. Any acid mixed with the hydrocyanic acid decomposes the iodo-cyanide of potassium and mercury, and forms biniodide of mercury, which is of a red colour.

Acidum Nitricum. *Nitric Acid.*—By heat it wholly passes off in vapour. When mixed with distilled water, neither nitrate of silver nor chloride of barium throws down anything. Its specific gravity is 1·50. About 217 grains of the crystals of carbonate of soda are saturated by 100 grains of this acid.

Remarks.—The total evaporation proves that no fixed impurity is held in solution by the acid. Nitrate of silver gives no precipitate when chlorine or its compounds are absent; chloride of barium gives a precipitate of sulphate of barytes when sulphuric acid or a sulphate is present. Two hundred and seventeen grains of carbonate of soda are equivalent to about 81 grains of real nitric acid.

Acidum Phosphoricum Dilutum. *Diluted Phosphoric Acid.*—Chloride of barium or nitrate of silver being added, whatever is thrown down is readily dissolved by nitric acid. Strips of copper and silver are not at all acted upon by it, nor is it coloured when hydrosulphuric acid is added. Its specific gravity is 1·064; 42 grains of carbonate of soda are saturated by 100 grains of this acid, and nothing is thrown down.

Remarks.—The absence of sulphuric acid and of a sulphate is proved by there being no precipitate yielded by chloride of barium, which is insoluble in nitric acid; that no hydrochloric acid nor any chloride is held in solution, is proved by nitrate of silver giving no precipitate which is insoluble in nitric acid. The quantity of carbonate of soda neutralized by 100 grains of this acid shows that it contains 10·5 per cent. of real phosphoric acid; and when the carbonate of soda gives no precipitate, no phosphate of lime nor other phosphate insoluble in water is dissolved by the phosphoric acid.

Acidum Sulphuricum. *Sulphuric Acid.*—It is free from colour. Its specific gravity is 1·845. What remains after the acid has been distilled to dryness does not exceed the four hundredth part of its weight. Diluted

sulphuric acid is scarcely coloured by hydrosulphuric acid.

Remarks.—Its being colourless shows that no carbonaceous matter has fallen into and been decomposed by the acid. The small quantity of matter left after distillation to dryness is sulphate of lead, and sometimes a little sulphate of potash. The non-production of colour by hydrosulphuric acid, as well as the small quantity of matter left by distillation, show that the acid contains no important metallic impregnation.

Acidum Tartaricum (*crystalli*). *Tartaric Acid* (*crystals*).—Totally soluble in water. The solution throws down bitartrate of potash from any neutral salt of potash. Whatever is precipitated from this solution by acetate of lead, is dissolved by diluted nitric acid.

Remarks.—The insolubility of any precipitate produced in the solution of tartaric acid by acetate of lead, in dilute nitric acid, would show that the tartaric acid contains either sulphuric acid or a sulphate.

Aconitina. *Aconitina.*—An alkali prepared from the leaves and roots of Aconite. It is very soluble in sulphuric æther, less in alcohol, and very slightly in water. It is totally consumed in the fire, no salt of lime remaining. This substance possessing strong power, is not to be rashly employed.

Remarks.—As it consists of hydrogen, carbon, oxygen, and azote, it is of course entirely destructible by fire, and any remaining substance is an impurity.

Adeps. *Lard.*—Is not to be used without being carefully washed with water.

Ærugo. *Verdigris.*—May be partly dissolved in water, and is almost entirely soluble either in ammonia, or with the assistance of heat, in diluted sulphuric acid.

Æther Sulphuricus. *Sulphuric Æther.*—Its specific gravity is 0·750. What is sold fluctuates between 0·733 and 0·765. It totally evaporates in the air. It reddens litmus slightly: it combines sparingly with water; for example, in the proportion of a fluidounce to half a pint, and remains limpid.

Remarks.—The specifically lighter it is the sooner it evaporates, and it contains the less alcohol or water. If it redden litmus strongly, it has been either improperly prepared or too

long kept. The more perfect it is the less water or alcohol it contains, and the less soluble it is in water.

ALCOHOL. *Alcohol.*—The specific gravity of this is 0·815; it is free from colour; when heated it evaporates; it combines with water and with æther; it tastes and smells like wine.

ALUMEN (*crystallinum*). *Alum* (*crystalline*).—It is entirely soluble in water. From the solution, ammonia or potash, when added, throws down alumina free from colour; which again dissolves when the potash is added in excess.

Remarks.—The crystallization in octohedrons and perfect solubility in water show that there is no uncombined earthy matter; and the precipitation by ammonia and potash, the solubility of the precipitate in excess of the latter, and its being colourless, show that pure alumina has been precipitated.

AMMONIÆ LIQUOR. *Solution of Ammonia.*—By heat it totally evaporates in evanescent alkaline vapours, as shown by turmeric. It gives no precipitate with lime-water. When saturated with nitric acid neither sesquicarbonate of ammonia nor nitrate of silver throws down anything. The specific gravity of this solution is 0·960.

Remarks.—Pure water remains after the expulsion of the ammoniacal gas. If lime-water give no precipitate with solution of ammonia, it shows that it contains no carbonic acid; and if neither sesquicarbonate of ammonia nor nitrate of silver give any precipitate when it has been saturated with nitric acid, it proves that no earthy matter, hydrochloric acid, nor any chloride is present.

AMMONIÆ LIQUOR FORTIOR. *Stronger Solution of Ammonia.*—The specific gravity of this is 0·882. This solution may be reduced to the strength of Liquor Ammoniæ by adding to every fluidounce of it two fluidounces of distilled water.

Its properties are similar to those of Ammoniæ Liquor.

AMMONIÆ ACETATIS LIQUOR. *Solution of Acetate of Ammonia.*—It is not coloured by the addition of hydrosulphuric acid, nor is anything precipitated by nitrate of silver or chloride of barium. The water being evaporated, the residue yields ammonia, and is dissipated by heat.

Remarks.—When the vinegar has been improperly distilled and condensed in a metallic worm, it usually contains some me-

tallic oxide, which is detected by hydrosulphuric acid. Nitrate of silver gives crystals of acetate of silver, soluble in water; and a precipitate of chloride of silver, with hydrochloric acid, if there be any, which neither water nor nitric acid dissolves; and chloride of barium yields sulphate of barytes with sulphuric acid, if it be present. Acetate of ammonia is totally decomposed and dissipated by heat, and if there be any residue after its operation, it is an impurity.

AMMONIÆ HYDROCHLORAS (*crystallina*). *Hydrochlorate of Ammonia* (*crystalline*).—Translucent; it is sublimed by heat and totally dissolved by water. It changes the colour of litmus slightly red. Chloride of barium throws down nothing. Potash or lime being added to it, ammonia is evolved.

AMMONIÆ SESQUICARBONAS (*crystallina*). *Sesquicarbonate of Ammonia* (*crystalline*).—Translucent, but falls to powder in the air; it is totally dissipated by heat. It is entirely soluble in water; it changes the colour of turmeric. Nitric acid being added to it to saturation, nothing is thrown down either by chloride of barium or nitrate of silver.

Remarks.—When it has lost its transparency it is less pungent to the smell and less active as a medicine, being partially or totally converted into bicarbonate of ammonia: if anything remain after the application of heat or the action of water, it is an impurity. The non-action of nitrate of silver and chloride of barium, after saturation with nitric acid, proves the absence of hydrochloric and sulphuric acid.

ANTIMONII OXYSULPHURETUM. *Oxysulphuret of Antimony.*—Totally soluble in nitro-hydrochloric acid, emitting hydrosulphuric acid.

Remarks.—By boiling in a solution of bitartrate of potash it loses about 12 per cent., which is protoxide of antimony.

ANTIMONII POTASSIO-TARTRAS (*crystalli*). *Potassio-tartrate of Antimony* (*crystals*).—Totally soluble in water, no bitartrate of potash remaining in the vessel; and hydrosulphuric acid being added, a reddish-coloured precipitate is obtained. Neither chloride of barium nor nitrate of silver being added to [a dilute] solution, precipitates anything. Nitric acid throws down a precipitate, which is dissolved by an excess of it.

Remarks.—The crystalline form, and solubility in a moderate quantity of water, prove the absence of bitartrate of potash un-

combined with oxide of antimony. Hydrosulphuric acid precipitates red hydrated sesquisulphuret of antimony. The non-action of chloride of barium proves the absence of sulphuric acid and sulphates, and that of nitrate of silver, the absence of chlorine and chlorides. Nitric acid precipitates oxide of antimony, which an excess of it redissolves. A little carbonate of soda dropped into a boiling solution should give a precipitate which does not redissolve.

Antimonii Sesquisulphuretum (*striatum*). *Sesquisulphuret of Antimony* (*striated*).—With heat it is totally dissolved by hydrochloric acid. From the acid in which it is boiled, a white precipitate is thrown down by distilled water; from the strained liquor hydrosulphuric acid afterwards throws down a reddish-coloured substance.

Remarks.—Hydrochloric acid would dissolve some lead, if any of that metal in the state of sulphuret existed in the sesquisulphuret of antimony: this would remain in solution after the precipitation of the white substance by water, and hydrosulphuric acid would then give a dark-coloured precipitate with the strained solution instead of the reddish one, derived from a small quantity of antimony not thrown down by the water. If also any copper had been dissolved, the same appearance would be induced by hydrosulphuric acid as with lead.

Argentum. *Silver.*—It is totally dissolved by diluted nitric acid. This solution on the addition of chloride of sodium throws down a precipitate, which an excess of ammonia dissolves, and it should be free from colour. The chloride of silver being removed, and hydrosulphuric acid added to the solution, it is not coloured by it, and nothing is thrown down. The specific gravity of silver is 10·4.

Remarks.—If the silver contain gold, which is frequently the case, it remains undissolved as a dark-coloured powder; if lead, it will be dissolved by the nitric acid; and if the quantity be considerable, it will be precipitated with the silver, also in the state of a chloride by chloride of sodium, and this, unlike chloride of silver, would not be dissolved by excess of ammonia, but readily by potash. When the chloride of silver is removed, the liquor may contain copper and some lead; with these hydrosulphuric acid would give dark-coloured precipitates.

Argenti Nitras. *Nitrate of Silver.*—It is originally white, but blackens by exposure to light. It is entirely soluble in water. Copper put into the solution precipi-

tates silver; its other properties are as above detailed respecting silver.

Remarks.—If silver containing copper be used, the nitrate is greenish by the presence of subnitrate, or blackish on account of the oxide of copper which it contains. Chloride of sodium should give a white precipitate totally soluble in excess of ammonia, which it will not do if it contain chloride of lead. The solution after precipitation and the removal of the chloride of silver should give no precipitate, nor suffer any discoloration by hydrosulphuric acid; if it should, copper or lead, or both, may be present.

Argenti Cyanidum. *Cyanide of Silver.*—By heat it yields cyanogen, and is reduced to silver.

Remarks.—If pure, the residual silver will be totally dissolved by nitric acid, and the solution will exhibit the properties above described respecting silver.

Barytæ Carbonas. *Carbonate of Barytes.*—Totally soluble in diluted hydrochloric acid. This solution, on the addition of ammonia or hydrosulphuric acid, does not give any precipitate, and it remains colourless: when more sulphuric acid is added than is necessary to saturation, nothing is afterwards thrown down by carbonate of soda.

Remarks.—If totally soluble in hydrochloric acid, it contains no sulphate of barytes; if ammonia occasion no precipitate, it contains no alumina, oxide of lead, nor peroxide of iron; if hydrosulphuric acid occasion no colour, it is free from copper or lead; if carbonate of soda throw down nothing from the solution from which the sulphate of barytes has been precipitated by sulphuric acid, it contains no lime.

Bismuthium. *Bismuth.*—It is dissolved by diluted nitric acid; when subnitrate of bismuth is precipitated from this solution by ammonia, the liquor is free from colour. Its specific gravity is 9·8.

Remarks.—If the bismuth contain copper, a blue-coloured solution remains after the precipitation of the subnitrate of bismuth by ammonia.

Bismuthi Trisnitras. *Trisnitrate of Bismuth.*—It is soluble in nitric acid without effervescence. Diluted sulphuric acid being added to the solution, nothing is thrown down.

Remarks.—If it possess these properties, it contains no carbonate whatever, nor any oxide of lead.

Borax (*crystalli*). *Borax* (*crystals*).—Totally soluble in water. Sulphuric acid throws down scaly crystals from the solution. These dissolved in alcohol burn with a green-coloured flame.

Remarks.—The crystals are boracic acid, separated from the soda of the borax by its superior affinity for sulphuric acid; sulphate of soda remains in solution.

Brominium. *Bromine.*—Evaporates at a gentle heat, with an acrid smell. It is sparingly soluble in water, more in rectified spirit, and most in æther. Its specific gravity is 3·0.

Calamina. *Calamine.*—Almost entirely soluble in diluted sulphuric acid, emitting a few bubbles of carbonic acid, unless it has been previously burnt. The solution, when ammonia or potash is added to it, gives a precipitate, which either of them added in excess dissolves.

Remarks.—If soluble in sulphuric acid, the calamine can contain but little carbonate of lime. The sulphuric solution should be colourless, and remain so, after the addition of the excess of ammonia; if blue, copper is present; if it contain iron, both ammonia and potash throw down the oxide, which neither of them redissolves when added in excess.

Calcii Chloridum. *Chloride of Calcium.*—Free from colour; slightly translucent; hard and friable; totally soluble in water: the solution gives no precipitate on the addition of ammonia or chloride of barium, nor when diluted with much water, with ferrocyanide of potassium.

Calcis Hydras. *Hydrate of Lime.*—Dissolves in dilute hydrochloric acid without effervescence. Ammonia added to the solution throws down nothing.

Remarks.—The solubility in dilute hydrochloric acid without effervescence proves the absence of carbonic acid, that the lime has been well burnt, and that no silica is present. If the solution give no precipitate with ammonia, it contains neither oxide of iron nor alumina.

Calx. *Lime.*—Water being added it cracks and falls to powder. Its other properties are as above mentioned.

Remarks.—Such portions as do not slack on the addition of water are insufficiently burnt; and when put into dilute hydrochloric acid effervesce, on account of the undecomposed carbonate of lime which they contain.

Calx Chlorinata. *Chlorinated Lime.*—Dissolves in dilute hydrochloric acid, emitting chlorine.

Remarks.—The chlorine gas is recognised by its green colour, peculiar odour, and power of destroying vegetable and animal colour.

Carbo Animalis (*purificatus*). *Animal Charcoal* (*purified*).—Emits no bubbles on the addition of hydrochloric acid; nor is anything thrown down from the acid either by ammonia or the sesquicarbonate of ammonia.

Remarks.—The purification is effected by means of hydrochloric acid, which should dissolve all the carbonate and phosphate of lime; if any of the former remain, it will dissolve with effervescence on the addition of hydrochloric acid, and the solution gives a precipitate with sesquicarbonate of ammonia; if phosphate of lime be dissolved by the hydrochloric acid, the solution gives a precipitate both with ammonia and the sesquicarbonate of ammonia, which is phosphate of lime.

Cornu. *Horn.*—After it has been well burnt is almost entirely dissolved by nitric acid; then lime is separated by oxalate of ammonia; and phosphoric acid is precipitated by nitrate of lead.

Remarks.—The phosphate of lime, of which the horn after burning almost entirely consists, is dissolved by the nitric acid; oxalate of lime is formed on adding oxalate of ammonia to the solution, which being insoluble in water is precipitated. Phosphate of lead results from the union of the phosphoric acid with the oxide of lead of the nitrate when added to the nitric solution, and this also being insoluble in water, it is precipitated.

Creasoton. *Creasote.*—Oleaginous; colourless; its smell peculiar; translucent; boils at 397°. Does not congeal at —50°. Soluble in acetic acid.

Creta. *Chalk.*—Totally soluble in dilute hydrochloric acid with effervescence. From this solution, after it has been boiled, when ammonia is dropped in, it throws down nothing.

Remarks.—If totally soluble in hydrochloric acid it contains no silica; and if the solution give no precipitate with ammonia, it is free from alumina and oxide of iron.

Cupri Sulphas (*crystalli*). *Sulphate of Copper* (*crystals*).—In the air it becomes slightly pulverulent and of a greenish colour. It is totally soluble in water. What-

ever ammonia throws down from this solution an excess of ammonia dissolves.

Remarks.—If it become very green on the surface by exposure to the air, it is owing to the presence of sesquioxide of iron: if it contain this oxide, it is precipitated by ammonia, and an excess does not redissolve it; whereas oxide of copper is readily taken up by it.

CUPRI AMMONIO-SULPHAS. *Ammonio-sulphate of Copper.*—By heat it is converted into oxide of copper, evolving ammonia. Dissolved in water it changes the colour of turmeric, and solution of arsenious acid renders it of a green colour.

Remarks.—If it do not alter the colour of turmeric there is no excess of sesquicarbonate of ammonia; and without this it is not totally soluble in water, but is decomposed by it with precipitation. Arsenious acid unites with the oxide of copper to form green arsenite of copper, which, being insoluble in water, is precipitated.

FERRI PERCYANIDUM. *Percyanide of Iron.*—It is pure if, after being boiled with dilute hydrochloric acid, ammonia throws down nothing from the filtered solution.

Remarks.—If the percyanide of iron contained uncombined sesquioxide of iron or any alumina, they would be dissolved by the hydrochloric acid and precipitated from the solution by ammonia.

FERRI AMMONIO-CHLORIDUM. *Ammonio-chloride of Iron.*—Totally soluble in proof spirit and in water. Potash added to the solution throws down sesquioxide of iron; afterwards, when added in excess, it evolves ammonia.

Remarks.—The iron of the sesquichloride is precipitated, by the action of the potash, in the state of sesquioxide; while another portion of this alkali decomposes the hydrochlorate of ammonia and evolves its ammonia.

FERRI IODIDUM. *Iodide of Iron.*—Emits violent vapours by heat, and sesquioxide of iron remains. When fresh prepared it is totally soluble in water. From this solution, when kept in a badly-stopped vessel, sesquioxide of iron is very soon precipitated; but with iron wire immersed in it, it may be kept clear in a well-stopped vessel.

Remarks.—By the action of the oxygen of the air the iron is converted into sesquioxide, which is insoluble in water; by the

operation of the metallic iron, without the access of air, the decomposition of the solution is prevented.

FERRI POTASSIO-TARTRAS. *Potassio-tartrate of Iron.*—Totally soluble in water: the solution does not change either litmus or turmeric; nor is it rendered blue by ferrocyanide of potassium; nor is anything precipitated from it by any acid or alkali. The magnet does not act upon it.

Remarks.—When improperly prepared, as by using bitartrate of potash and iron filings, a large portion is usually insoluble in water; and sometimes it contains metallic iron attracted by the magnet. Other salts of sesquioxide of iron give a blue precipitate with ferrocyanide of potassium, and the oxide is thrown down by any alkali. If the solution of this preparation act upon litmus-paper, the tartaric acid of the bitartrate of potash is not saturated either with sesquioxide of iron or ammonia.

FERRI SESQUIOXYDUM. *Sesquioxide of Iron.*—Dissolved totally by dilute hydrochloric acid with very slight effervescence, and it is precipitated by ammonia.

Remarks.—The effervescence denotes the presence of a small unimportant portion of carbonic acid; after the precipitation of the sesquioxide of iron by ammonia, neither hydrosulphuric acid nor ferrocyanide of potassium should produce any change in the solution.

FERRI SULPHAS (*crystalli*). *Sulphate of Iron* (*crystals*).—Colour bluish green; dissolved by water. Iron put into the solution does not precipitate copper.

Remarks.—When these crystals have been kept in a badly stopped bottle, or when exposed to the air, especially if moist, the protoxide of iron becomes sesquioxide, and the crystals are first rendered green, and eventually a yellow deposit is formed on their surface, and this is insoluble in water.

HYDRARGYRUM (*purificatum*). *Mercury* (*purified*).—Totally dissipated in vapour by heat. Dissolved by diluted nitric acid. When boiled in hydrochloric acid, the acid when cold is not coloured, nor is anything precipitated from it by hydrosulphuric acid. Its specific gravity is 13·5.

Remarks.—If the mercury contain other metals, most of them would remain after its vaporization; the solubility in nitric acid shows that it contains no tin, and hydrosulphuric acid not acting

upon the hydrochloric acid after the mercury has been boiled in it, indicates the absence of most other metals.

HYDRARGYRUM CUM CRETA. *Mercury with Chalk.*—Part is evaporated by heat; what remains is colourless, and totally soluble in acetic acid with effervescence; this solution is not coloured by hydrosulphuric acid. These substances can scarcely be so diligently triturated as that no globules shall be visible.

Remarks.—If the mercury be pure, then it is totally evaporated; and the residue is merely chalk or carbonate of lime, which the acetic acid dissolves with the evolution of carbonic acid. If the mercury contained any metal, it would either be left or dissolved by the acetic acid; if the latter, hydrosulphuric acid would, except in few cases, detect it in the solution.

HYDRARGYRI OXYDUM (*cinereum*). *Oxide of Mercury* (*grey*).—Digested for a short time with diluted hydrochloric acid and strained, neither solution of potash nor oxalate of ammonia throws down anything. It is totally soluble in acetic acid. By heat it is entirely dissipated.

Remarks.—If the oxide of mercury be pure, it is totally converted by hydrochloric acid into protochloride, which remains insoluble. If it contain any binoxide, it will be dissolved by the acid and precipitated from solution of an orange colour by potash; and if during its preparation any carbonate of lime should have been precipitated with the oxide of mercury, it will be dissolved by the hydrochloric acid, and precipitated as an insoluble oxalate by the oxalate of ammonia. If it contain undecomposed chloride of mercury, it will remain after the action of the acetic acid; and anything which is not evaporated by heat is an impurity.

HYDRARGYRI BINOXYDUM (*rubrum*). *Binoxide of Mercury* (*red*).—On the application of heat it yields oxygen, and the mercury either runs into globules, or is totally dissipated. It is entirely soluble in hydrochloric acid.

Remarks.—When it is dissolved in nitric acid, no precipitate is yielded by nitrate of silver; or if there should be any, either it has not been sufficiently washed, or the bichloride of mercury has been imperfectly decomposed, and, consequently, precipitates the silver of the nitrate of silver as a chloride.

HYDRARGYRI NITRICO-OXYDUM. *Nitric-oxide of Mercury.*—On the application of heat no nitric vapour is emitted. Neither lime-water nor hydrosulphuric acid

throws down anything from the water in which it has been boiled. In other respects it resembles the preceding preparation.

Remarks.—Nitric vapour, should it arise, results from the decomposition of nitric acid, which should have been previously expelled by heat; if lime-water or hydrosulphuric acid throw down anything from the water in which it is boiled, it is because some nitrate of mercury undecomposed by heat has been dissolved by the water; or it contained some other metallic salt.

HYDRARGYRI AMMONIO-CHLORIDUM. *Ammonio-chloride of Mercury.*—Totally evaporated by heat. When digested with acetic acid, iodide of potassium throws down nothing either yellow or blue. The powder rubbed with lime-water does not become black. It is totally dissolved by hydrochloric acid without effervescence. When heated with solution of potash it becomes yellow, and emits ammonia.

Remarks.—If it contain any fixed impurity, it would not be evaporated by heat. The non-production of a yellow or blue colour by iodide of potassium in the acetic solution shows that it contains neither oxide of lead nor starch, for the oxide would yield a yellow iodide of lead, and the starch would give a blue precipitate. If lime-water impart blackness to it, it would indicate the presence of protoxide of mercury. If it dissolve without effervescence in hydrochloric acid, no carbonate of lime or other carbonate has been mixed with it. There is no other white substance which, when heated with potash, yields ammonia and becomes yellow.

HYDRARGYRI CHLORIDUM. *Chloride of Mercury.*—A whitish powder, which on the addition of potash becomes black, and then, when heated, runs into globules of mercury. It is also totally vaporized by heat. The distilled water with which it has been washed, or in which it has been boiled, gives no precipitate with nitrate of silver, lime-water, nor hydrosulphuric acid.

Remarks.—Chloride of mercury yields protoxide of that metal by potash, which is black, and this by being heated loses oxygen, and is reduced to metallic mercury. If by heat it be totally vaporized, it contains no fixed impurity. If it contain bichloride of mercury, that would be dissolved by water; and from this solution nitrate of silver would throw down chloride of silver; lime-water, yellowish binoxide of mercury; and hydrosulphuric acid, a sulphuret of mercury.

HYDRARGYRI BICHLORIDUM (*crystallinum*). *Bichloride of Mercury* (*crystalline*).—It liquefies by heat and sublimes. It is totally soluble in water and sulphuric æther. Whatever is thrown down from water, either by solution of potash or lime-water, is of a reddish colour; or if a sufficient quantity be added, it is yellow; this yellow substance by heat emits oxygen, and runs into globules of mercury.

Remarks.—Whatever remains after exposure to heat is an impurity. If it contain chloride of mercury, it is insoluble in water. The yellow substance precipitated by potash is hydrated binoxide of mercury, which when heated loses water and oxygen, and metallic mercury remains, or may be dissipated by increasing the heat.

HYDRARGYRI BICYANIDUM (*crystalli*). *Bicyanide of Mercury* (*crystals*).—Transparent and totally soluble in water. The solution, when hydrochloric acid is added, emits hydrocyanic acid, which is known by its peculiar smell; and a glass moistened with the solution of nitrate of silver and placed over it, gives a deposit, which is dissolved by boiling nitric acid. By heat it emits cyanogen, and runs into globules of mercury.

Remarks.—Bichloride of mercury remains after the action of hydrochloric acid upon the bicyanide. Whatever is not volatilized by heat is an impurity.

HYDRARGYRI IODIDUM. *Iodide of Mercury.*—When recently prepared it is yellowish, and when heat is cautiously applied it sublimes in red crystals, which afterwards become yellow, and then by access of light they blacken. It is not soluble in chloride of sodium.

HYDRARGYRI BINIODIDUM. *Biniodide of Mercury.*—By heat cautiously applied it is sublimed in scales, which soon become yellow, and afterwards, when they are cold, red. It is partially soluble in boiling rectified spirit, which affords crystals as it cools. It is alternately dissolved and precipitated by iodide of potassium and bichloride of mercury. It is totally soluble in chloride of sodium.

HYDRARGYRI BISULPHURETUM (*rubrum*). *Bisulphuret of Mercury* (*red*).—Totally evaporated by heat, and on potash being added to it, it runs into globules of mercury. It is not dissolved either by nitric or hydrochloric acid,

but is so by a mixture of them. Rectified spirit, with which it has been boiled or washed, acquires no red colour. Digested with acetic acid it yields no yellow precipitate by iodide of potassium.

Remarks.—When heated by itself it is volatilized undecomposed, but when heated with potash it is decomposed, and mercury is obtained. No acid dissolves it, but the nascent chlorine yielded by the mutual decomposition of nitric and hydrochloric acids converts it into bichloride of mercury which dissolves; and the sulphur becomes sulphuric acid. If it contain any deutoxide of lead, a portion of that would be dissolved by acetic acid, and the solution would give a yellow iodide of lead, with iodide of potassium.

Hydrargyri Sulphuretum cum Sulphure (*nigrum*). *Sulphuret of Mercury with Sulphur* (*black*).—Totally evaporates by heat, no charcoal nor phosphate of lime being left.

Remarks.—If adulterated with animal charcoal, phosphate of lime would remain after calcination in a strong heat.

Iodinium. *Iodine.*—On the application of heat it first fuses, and then sublimes in a purple vapour. It is very slightly soluble in water, but more soluble in alcohol. With starch it produces a blue colour.

Lacmus. *Litmus.*—Soluble both in water and alcohol. Its blue colour is reddened by acids, and is restored by the addition of alkalis.

Manganesii Binoxydum. *Binoxide of Manganese.*—Soluble in hydrochloric acid, evolving chlorine. What is thrown down from the solution by potash is at first white, and soon becomes brown; it rarely also happens that ferrocyanide of potassium does not render it green. When first dried and afterwards heated to whiteness, 100 parts lose 12.

Remarks.—If it dissolve in hydrochloric acid without effervescence or residue, and without giving a greenish or blue tint with ferrocyanide of potassium, it contains neither any carbonate, earthy matter, nor oxide of iron. The brown colour, which the white precipitate obtained by potash soon assumes, is derived from the absorption of oxygen. The loss of 12 per cent. is owing to the expulsion of oxygen, and red oxide of manganese is left.

Magnesia. *Magnesia.*—Dissolves in hydrochloric acid without effervescence. Neither bicarbonate of potash,

nor chloride of barium throws down anything from the solution. It turns turmeric slightly brown.

Remarks.—The solubility in hydrochloric acid without effervescence shows that the carbonic acid has been perfectly expelled; any substance which remains unacted upon by the acid is an impurity. If the magnesia contained lime, it would be precipitated from the solution by the bicarbonate of potash; and if insufficiently washed, the sulphate and carbonate of soda which it might contain would be precipitated by the chloride of barium. It acts but slightly on turmeric paper even when moistened.

Magnesiæ Carbonas. *Carbonate of Magnesia.*—The water in which it is boiled does not alter the colour of turmeric; chloride of barium or nitrate of silver added to the water does not precipitate anything. One hundred parts dissolved in dilute sulphuric acid lose 36·6 parts in weight. When the effervescence has ceased, bicarbonate of potash does not precipitate anything from this solution.

Remarks.—If the water in which it is boiled alter turmeric, excess of carbonate of soda has been used, and the carbonate of magnesia has not been sufficiently washed. If chloride of barium give a precipitate in the water, then either carbonate of soda or sulphate of soda, or both, may be present from insufficient washing; and a precipitate yielded by nitrate of silver, insoluble in nitric acid, would indicate the presence of a chloride. The loss of 36·6 per cent. in weight by dissolving it in dilute sulphuric acid, is derived from the expulsion of carbonic acid. Bicarbonate of potash does not precipitate magnesia from sulphuric acid; if, therefore, there be any precipitate on mixing them, it is derived from impurity.

Magnesiæ Sulphas (*crystalli*). *Sulphate of Magnesia* (*crystals*).—Very readily dissolved by water. Sulphuric acid dropt into the solution does not expel any hydrochloric acid. One hundred grains dissolved in water and mixed with a boiling solution of carbonate of soda, yield 34 grains of carbonate of magnesia when dried.

Remarks.—The non-emission of hydrochloric acid on the addition of sulphuric acid, shows that no notable quantity of any chloride is present. If 34 grains of dry carbonate of magnesia be obtained, the sulphate of magnesia is unmixed with sulphate of soda.

Marmor. *Marble.*—White, dissolves in hydrochloric acid with effervescence. Ammonia throws down nothing

from this solution, nor is it decomposed by the addition of a solution of sulphate of lime in water.

Remarks.—If ammonia throw down anything from the solution after boiling, it must be an impurity, for lime is not precipitated by it. If solution of sulphate of lime give a precipitate, it is probably sulphate of barytes or strontia, or must be occasioned by some other impurity.

MEL. *Honey.*—Is not to be used without being despumated. Dissolved in water, iodide of potassium and any acid being added, it does not become of a blue colour.

Remarks.—The non-production of a blue colour shows, that neither starch nor flour has been fraudulently mixed with the honey.

MORPHIA. *Morphia.*—Very little soluble in cold water, little in boiling water, but very readily in alcohol; this solution exhibits alkaline properties when tried with turmeric; and when the spirit is distilled from it, it yields crystals, which are totally destroyed by heat. On the addition of nitric acid, morphia becomes first red, and afterwards yellow. Tincture of sesquichloride of iron gives it a blue colour. Chlorine and ammonia being added to its salts, they are rendered of a brown colour, which is destroyed when more chlorine is added. Morphia is also precipitated from its salts by solution of potash, which added in excess redissolves it.

Remarks.—The solution of chlorine should be freshly prepared, or have been kept from the access of light; it is to be first added to the morphia, its salts or their solutions, and then the solution of ammonia. This order of mixing must be observed.

MORPHIÆ ACETAS (*crystalli*). *Acetate of Morphia* (*crystals*).—Very readily dissolved in water. Its other properties are such as have been stated of morphia.

MORPHIÆ HYDROCHLORAS (*crystalli*). *Hydrochlorate of Morphia* (*crystals*).—Soluble in water. What is precipitated from the solution by nitrate of silver is not totally dissolved either by ammonia, unless added in excess, or by hydrochloric or nitric acid.

OLEUM ÆTHEREUM. *Æthereal Oil.*—Odour peculiar, and slightly acrid; totally soluble in sulphuric æther, and does not show acidity with litmus. Its specific gravity is 1·05.

PHOSPHORUS. *Phosphorus.*—Nearly free from colour, translucent like wax, emits light in the dark. It is sparingly dissolved by most distilled oils and sulphuric æther. Phosphorus should be kept in water and excluded from light.

PLUMBI ACETAS (*crystalli*). *Acetate of Lead* (*crystals*). —Dissolved by distilled water. By carbonate of soda a white precipitate is thrown down from the solution, and by iodide of potassium a yellow one; by hydrosulphuric acid it is blackened. Sulphuric acid evolves acetic vapours. By heat it first fuses, and is afterwards reduced to metallic lead.

Remarks.—The white precipitate by carbonate of soda is carbonate of lead; the yellow one by iodide of potassium, is iodide of lead; and the black one by hydrosulphuric acid, is sulphuret of lead. The acetic acid vapour is emitted on account of the greater affinity of sulphuric acid for oxide of lead, with which it forms a white precipitate of sulphate of lead.

PLUMBI DIACETATIS LIQUOR. *Solution of Diacetate of Lead.*—Its specific gravity is 1·260. Its other properties are similar to those of the last preparation.

PLUMBI CARBONAS. *Carbonate of Lead.*—Dissolved with effervescence in dilute nitric acid. What is precipitated from the solution by potash is white, and is redissolved by excess of it: it becomes black on the addition of hydrosulphuric acid. It becomes yellow by heat, and with the addition of charcoal it is reduced to metallic lead.

Remarks.—If totally soluble in nitric acid, it contains neither sulphate of lead nor of barytes; pure oxide of lead is totally dissolved by potash, and yields black sulphuret of lead with hydrosulphuric acid. By heat it loses carbonic acid, and becomes protoxide of lead, which, when heated with charcoal, yields to it oxygen, and is reduced to the metallic state.

PLUMBI CHLORIDUM (*crystallinum*). *Chloride of Lead* (*crystalline*).—Totally dissolved by boiling water, the chloride concreting almost entirely into crystals as it cools. On the addition of hydrosulphuric acid it becomes black, and by heat yellow.

Remarks.—If totally soluble in water it is free from sulphate of lead.

PLUMBI IODIDUM. *Iodide of Lead.*—Totally dissolved

by boiling water, and as it cools separates in shining yellow scales. It melts by heat, and the greater part is dissipated first in yellow, and afterwards in violet vapours.

PLUMBI OXYDUM (*semivitreum*). *Oxide of Lead* (*semivitreous*).—Almost entirely soluble in dilute nitric acid. Its other properties are the same as those of carbonate of lead preceding.

PLUMBI OXYDUM (*hydratum*). *Oxide of Lead* (*hydrated*).—What is used in preparing disulphate of quina should be totally dissolved by dilute nitric acid. Its remaining properties resemble those of the preceding.

POTASSÆ LIQUOR. *Solution of Potash.*—Its specific gravity is 1·063. It strongly changes the colour of turmeric to brown. Dilute nitric acid being added, but very few, or no, bubbles of carbonic acid are given out; from the saturated solution scarcely anything whatever should be precipitated either by carbonate of soda, chloride of barium, or nitrate of silver. From this solution, or from any salt of potash dissolved in water, the precipitate thrown down by chloride of platina is yellowish.

Remarks.—Its action upon turmeric evinces the well-known alkaline power of potash. If much carbonic acid be given out on the addition of the nitric, it shows that the lime used in preparing the solution was deficient in quantity or quality. When converted into nitrate of potash by means of nitric acid, if it give a precipitate with carbonate of soda, some earthy or metallic impurity is present; if with chloride of barium, a sulphate; and if with nitrate of silver, a chloride renders the solution impure. The yellow precipitate yielded by chloride of platina is a double chloride of potassium and platina, which distinguishes potash and its salts from soda and its compounds.

POTASSÆ HYDRAS. *Hydrate of Potash.*—In an open vessel it speedily liquefies. It is totally soluble in alcohol. Its other properties are as above.

POTASSA CUM CALCE. *Potash with Lime.*—Mixes with water; on the addition of an acid it yields no carbonic acid. It is not entirely dissolved in alcohol.

Remarks.—The potash only is taken up by the alcohol, the lime remains.

POTASSÆ ACETAS. *Acetate of Potash.*—Is totally dis-

solved both by water and by alcohol; the solution does not affect either litmus or turmeric. Nothing is precipitated from the aqueous solution either by chloride of barium or nitrate of silver; if the solution be strong, then any precipitate which the latter may occasion is redissolved on the addition of dilute nitric acid or water. By a red heat it is totally converted into carbonate of potash. Sulphuric acid added to it emits acetic vapours.

Remarks.—Its total solubility in water proves the absence of insoluble mechanical admixture, and its solubility in alcohol shows that it contains no sulphate of potash: that the solution produces no change either upon litmus or turmeric proves that there is no excess either of acid or alkali. If it contain sulphate of potash, sulphate of barytes will be precipitated by chloride of barium, and if chloride of potassium, chloride of silver will be thrown down from the nitrate. From a strong solution acetate of silver may be precipitated by the nitrate; this redissolves on the addition of dilute nitric acid or water, which the chloride of silver does not. At a red heat the acetic acid is decomposed, its hydrogen is expelled, and its carbon and oxygen or portions of them, forming carbonic acid, it remains in combination with the potash. Sulphuric acid expels the acetic acid, and sulphate of potash remains.

Potassæ Carbonas. *Carbonate of Potash.*—Almost entirely dissolved by water; in an open vessel it spontaneously liquefies. It changes the colour of turmeric brown. When supersaturated with nitric acid, neither carbonate of soda nor chloride of barium throws down anything, and nitrate of silver but little. One hundred parts lose 16 of water by a strong heat, and the same quantity loses 26·3 parts of carbonic acid on the addition of dilute sulphuric acid.

Remarks.—The portion insoluble in water is in general a small quantity of earthy impurity. When carbonate of soda produces no precipitate in the nitric solution, there is no earthy impurity; chloride of barium indicates the presence of a sulphate, and nitrate of silver of a chloride, when they occasion precipitates.

Potassæ Carbonatis Liquor. *Solution of Carbonate of Potash.*—Specific gravity 1·473. Its other properties as above mentioned.

Potassæ Bicarbonas (*crystalli*). *Bicarbonate of Potash* (*crystals*).—Totally dissolved by water, and the solution slightly changes the colour of turmeric. Sul-

phate of magnesia throws down nothing from this solution unless it be heated. From 100 parts 30·7 are expelled by a red heat. After the addition of excess of nitric acid chloride of barium throws down nothing, and nitrate of silver very little, if anything.

Remarks.—When not thoroughly converted into bicarbonate of potash, the action of the solution upon turmeric paper is stronger. If any magnesia be precipitated from the sulphate without the application of heat, it also denotes the existence of an imperfect bicarbonate. The 30·7 parts expelled by heat are carbonic acid and water; if the crystals be not dry, the loss of water will be greater; and if the carbonic acid be deficient, it will be diminished. The non-action of chloride of barium, after saturation with nitric acid, proves the absence of sulphates, and the slight precipitation usually occasioned by nitrate of silver shows but a minute portion of chlorides.

Potassæ Chloras (*crystalli*). *Chlorate of Potash* (*crystals*).—Totally dissolved by distilled water. The solution throws down nothing on the addition of nitrate of silver. It liquefies by heat, and if it be more strongly urged it yields oxygen, and is converted into chloride of potassium. A little sulphuric acid dropt on the crystals, the salt first becomes yellow, afterwards red, and gives out peroxide of chlorine.

Remarks.—If any chloride of potassium be present, then nitrate of silver gives a precipitate of chloride of silver. One hundred grains yield nearly 39 grains of oxygen, and leave 61 of chloride of potassium.

Potassæ Nitras (*crystalli*).—*Nitrate of Potash* (*crystals*).—Totally dissolved by distilled water. Neither chloride of barium nor nitrate of silver precipitates anything from the solution. It liquefies by heat, and in a strong fire it yields oxygen, and the salt remaining, rubbed to powder, gives nitrous vapours by sulphuric acid.

Remarks.—The non-action of chloride of barium and nitrate of silver proves the absence of a sulphate or a chloride. By heat and the loss of oxygen it becomes hyponitrite of potash, which the sulphuric acid decomposes, with the extrication of red vapours.

Potassæ Sulphas (*crystalli*). *Sulphate of Potash* (*crystals*). Insoluble in alcohol, and slightly soluble in distilled water. What is thrown down from the solution

by chloride of platina is yellowish, and by chloride of barium is white, and insoluble in nitric acid.

Remarks.—It has been already stated that the precipitate afforded with chloride of platina with the salts of potash is yellow; that yielded by chloride of barium is sulphate of barytes.

Potassæ Tartras (*crystalli*). *Tartrate of Potash* (*crystals*).—Readily dissolved by water. From the solution almost any acid throws down crystals of bitartrate of potash, most of which adhere to the vessel. Whatever is precipitated from the same solution by chloride of barium or acetate of lead is dissolved by dilute nitric acid.

Remarks.—If the tartrate of potash contain any sulphate, the precipitates yielded by chloride of barium and acetate of lead do not dissolve in dilute nitric acid.

Potassæ Bitartras (*crystalli*). *Bitartrate of Potash* (*crystals*).—It is sparingly dissolved by water. It renders the colour of litmus red. At a red heat it is converted into carbonate of potash.

Remarks.—The excess of acid reddens the litmus; by a red heat the tartaric acid is decomposed. Its carbon and oxygen combine to form carbonic acid, and this uniting with the potash forms a carbonate.

Potassii Bromidum (*crystalli*). *Bromide of Potassium* (*crystals*).—Totally dissolved by water. It does not alter the colour of litmus or turmeric. Chloride of barium throws down nothing from the solution. Sulphuric acid and starch added together render it yellow. Subjected to heat it loses no weight. Ten grains of this salt are capable of acting upon 14·28 grains of nitrate of silver and precipitating a yellowish bromide of silver, which is dissolved by ammonia, and but very little by nitric acid.

Remarks.—The non-action of litmus and turmeric proves the absence of free acid and alkali; and that of chloride of barium shows that no sulphate is present. The sulphuric acid decomposes the bromide, and the bromine set free produces the well-known yellow colour, with the starch. As it contains no water of crystallization it should lose no weight even by a strong heat. If it decompose a larger quantity of nitrate of silver than above stated, it is probably owing to the presence of chloride of potassium. When bromide of potassium, free from chloride, is mixed with chromate of potash and heated in a retort with sulphuric

acid, solution of ammonia, into which the product is received, contains no chromic acid.

Potassii Ferrocyanidum (*crystalli*). *Ferrocyanide of Potassium* (*crystals*).—Totally dissolved by water. A gentle heat evaporates 12·6 parts from 100 parts. It slightly [if at all] alters the colour of turmeric. What it throws down from the preparations of sesquioxide of iron is blue, and that from the preparations of zinc is white. When burnt, the residue dissolved by hydrochloric acid is again thrown down by ammonia; 18·7 parts of sesquioxide of iron are yielded by 100 parts.

Remarks.—The 12·6 parts separated from 100 by a gentle heat are water. The action upon turmeric paper, when it occurs, is probably derived from a little undecomposed potash retained by the water of crystallization; the blue precipitate occasioned in solutions of sesquioxide of iron is percyanide of iron or Prussian blue; the white one formed in solutions of zinc, is ferrocyanide of zinc. The 18·7 per cent. of sesquioxide of iron obtained after the action of a red heat result from the oxidizement of the metallic iron of the ferrocyanide of potassium.

Potassii Iodidum (*crystalli*). *Iodide of Potassium* (*crystals*).—Totally soluble in water and in alcohol. It alters the colour of turmeric either not at all or very slightly. It does not alter the colour of litmus. Subjected to heat it loses no weight. Sulphuric acid and starch added together it becomes blue. Ten grains of this salt are sufficient to decompose 10·24 grains of nitrate of silver; what is precipitated is partly dissolved by nitric acid and partly altered in appearance, which is not the case when ammonia is added.

Remarks.—The non-action upon turmeric and litmus proves the absence of an alkali or acid. It contains no water of crystallization, and therefore any loss occasioned by heat is mere adherent moisture. It is decomposed by sulphuric acid, and the iodine set free produces the characteristic blue colour by acting upon the starch. If it decomposes a larger proportion of nitrate of silver than above stated, it is probably owing to the presence of chloride of potassium. Iodide of silver is nearly insoluble in ammonia; when nitrate of silver is added to iodide of potassium, as long as precipitation occurs, the precipitate treated with excess of ammonia and supersaturated with nitric acid, becomes merely slightly opalescent.

Potassii Sulphuretum. *Sulphuret of Potassium.*—

Fresh broken it exhibits a brownish yellow colour. Dissolved in water, or in almost any acid, it exhales a smell of hydrosulphuric acid. The aqueous solution is of a yellow colour. What is thrown down by acetate of lead is first red, and it afterwards blackens.

Remarks.—By long keeping in imperfectly stopped vessels it absorbs oxygen, and being converted into sulphate of potash, it becomes nearly colourless, sparingly soluble in water, emits no smell of hydrosulphuric acid, and precipitates acetate of lead white.

Quina. *Quina.*—The alkali prepared from the bark of the heart-leaved Cinchona. Not dissolved by water, unless mixed with an acid, but readily dissolved by alcohol. It alters the colour of turmeric ; it has a bitter taste, and is totally destroyed by heat.

Quinæ Disulphas. *Disulphate of Quina.*—Totally dissolved in water, especially when mixed with an acid. Quina is thrown down by ammonia, the liquor being evaporated what remains ought not to taste of sugar. One hundred parts of disulphate of quina lose 8 to 10 parts of water with a gentle heat. It is totally consumed by fire. Chlorine first added to it, and afterwards ammonia, it becomes green.

Remarks.—The solution of chlorine should be freshly prepared, or have been kept from the access of light; it is to be first added to the solution of sulphate of quina and then the ammonia. This order of mixing must be observed.

One hundred grains, dissolved in water acidulated with hydrochloric acid, yield 26·6 grains of ignited sulphate of barytes, on the addition of a solution of chloride of barium.

Sodæ Acetas (*crystalli*). *Acetate of Soda* (*crystals*). —Totally dissolved by water, but not at all by alcohol. It does not alter the colour of litmus or turmeric. It is not precipitated by chloride of barium nor by nitrate of silver. In a strong fire it is converted into carbonate of soda. Sulphuric acid added evolves an acetic odour. From this or any other salt of soda dissolved in water, nothing is thrown down by chloride of platina.

Remarks.—The non-action of litmus, turmeric, and chloride of barium, shows that it is free from excess of acid or alkali, and that it contains no sulphate. In a strong solution, nitrate of silver occasions the formation and crystallization of acetate of silver, which

dissolves on the addition of water. In a strong heat the hydrogen of the acetic acid is expelled, and portions of its carbon and oxygen form carbonic acid, which combines with the soda to form the carbonate. Sulphuric acid decomposes this salt, expelling the acetic acid and forming sulphate of soda with the alkali. If it contain any salt of potash, it will be detected by the precipitate which it yields with chloride of platina.

SODÆ CARBONAS (*crystalli*). *Carbonate of Soda* (*crystals*).—When freshly prepared it is translucent, but in an open vessel it in a short time falls to powder. It is totally soluble in water, but not at all in alcohol. It alters the colour of turmeric like an alkali.

Remarks.—If usually pure and saturated with nitric acid it yields but little precipitate of chloride with the nitrate of silver, nor any sulphate of barytes with the chloride of barium.

SODÆ CARBONAS EXSICCATA. *Dried Carbonate of Soda.*—In drying this salt, 100 parts of the above-described crystals yield 62·5 by a strong heat. The remainder is unchanged.

SODÆ SESQUICARBONAS. *Sesquicarbonate of Soda.*—Totally dissolved by water. Neither chloride of platina, nor sulphate of magnesia, unless heated, throws down anything from this solution. By a strong fire it is converted into anhydrous carbonate of soda.

Remarks.—If it contain any salt of potash, chloride of platina would precipitate, as already noticed, a double salt of potassium and platina. The aqueous solution acts but slightly on turmeric paper. If it do not contain the proper quantity of carbonic acid, it will precipitate sulphate of magnesia without the application of heat.

SODÆ CARBONATIS LIQUOR EFFERVESCENS. *Effervescing Solution of Carbonate of Soda.*—The blue colour of litmus at first reddens in this solution: it returns when heated after the effervescence has ceased.

Remarks.—The conversion of the blue colour of litmus to red and its return after the application of heat, show that carbonic acid only has produced the effect.

SODÆ CHLORINATÆ LIQUOR. *Solution of Chlorinated Soda.*—At first the colour of turmeric is altered to brown in this solution, afterwards it is destroyed. When dilute hydrochloric acid is added, carbonic acid and chlorine are evolved together; solution of sulphate of indigo is

decolorized by the latter; lime is precipitated from lime-water by the former.

Remarks.—The alkaline effect upon turmeric paper is produced by the carbonate of soda, the subsequent bleaching effect by the chlorine. By the action of hydrochloric acid and the expulsion of the carbonic acid and chlorine, a solution of chloride of sodium is obtained. The lime thrown down from lime-water is in the state of carbonate.

Sodæ Phosphas (*crystalli*). *Phosphate of Soda* (*crystals*).—Exposed to the air it slightly effloresces. It is totally dissolved by water, but not by alcohol. What is thrown down from the solution by chloride of barium is white: the precipitate by nitrate of silver is yellow unless the phosphate of soda has been previously made red hot. Both precipitates are soluble in nitric acid.

Remarks.—If the precipitate obtained by chloride of barium is not totally soluble in nitric acid, the phosphate of barytes is mixed with sulphate. When the phosphate of soda has been heated it becomes pyrophosphate, and then gives a white pyrophosphate of silver, when added to the nitrate.

Sodæ Sulphas (*crystalli*). *Sulphate of Soda* (*crystals*).—Exposed to the air it falls to powder. Totally dissolved by water, very slightly by alcohol. It does not alter the colour of litmus or turmeric. Nitrate of silver throws down scarcely anything from a dilute solution; nitrate of barytes more, which is not dissolved by nitric acid. One hundred parts of this salt lose 55·5 parts by a strong heat.

Remarks.—If neither litmus nor turmeric be acted upon by this salt, it is as it should be, neutral. The precipitate obtained by nitrate of silver is a small portion of chloride, denoting the presence of chloride of sodium, the precipitate formed by nitrate of barytes is sulphate of barytes. The loss of 55·5 per cent. by a strong heat is water.

Sodæ Potassio-tartras (*crystalli*). *Potassio-tartrate of Soda* (*crystals*).—Totally dissolved by water. Neither chloride of barium nor nitrate of silver throws down anything from the [dilute] solution. It does not alter the colour of litmus or turmeric. By sulphuric acid, when added, part of it is converted into bitartrate of potash.

Remarks.—When neither litmus nor turmeric is altered in colour, the tartaric acid of the bitartrate of potash has been accurately saturated by soda. The non-precipitation by nitrate of

silver and chloride of barium proves the absence of any chloride and sulphate. The sulphuric acid takes half the potash from the tartaric, and thus converts the remainder into bitartrate, which precipitates in minute crystals.

Sodii Chloridum (*crystalli*). *Chloride of Sodium* (*crystals*).—Almost equally soluble in cold or hot water. It does not alter the colour of litmus or turmeric. Carbonate of soda or nitrate of barytes precipitates scarcely anything.

Remarks.—If neither litmus nor turmeric be acted upon, there is neither acid nor alkali present. If carbonate of soda give no precipitate, earthy salts are absent; and if nitrate of barytes give none, no sulphate is mixed with the salt.

Spiritus Ætheris nitrici.—The specific gravity of it is 0·834. It changes the colour of litmus slightly red. On the addition of carbonate of soda no bubbles of carbonic acid are produced. It is also distinguished by its characteristic smell.

Remarks.—If the specific gravity be greater than 0·834, water or excess of nitric acid, or both, are probably present. If litmus be strongly reddened there is great excess of acid, which decomposes carbonate of soda and expels carbonic acid.

Spiritus Ammoniæ. *Spirit of Ammonia.*—The specific gravity of this is 0·860.

Spiritus Ammoniæ aromaticus. *Aromatic Spirit of Ammonia.*—The specific gravity of this is 0·914.

Spiritus Ammoniæ fœtidus. *Fœtid Spirit of Ammonia.*—The specific gravity of this is 0·861.

Spiritus Rectificatus. *Rectified Spirit.*—The specific gravity of this is 0·838. It is free from colour, and is not rendered turbid on the addition of water. In taste and smell it resembles wine. This spirit may be reduced to proof spirit by adding to five pints of it three pints of distilled water at the temperature of 62°.

Spiritus tenuior. *Proof Spirit.*—The specific gravity of this is 0·920 according to the laws of the kingdom. Its other properties are similar to those of the preceding.

Stannum. *Tin.*—Boiled with hydrochloric acid it is almost entirely dissolved. The solution is free from co-

lour, but becomes purple on the addition of chloride of gold. What is precipitated by potash is white, and when added in excess it is redissolved. The specific gravity of tin is 7·29.

Strychnia (*crystalli*). *Strychnia* (*crystals*).—Readily dissolves in boiling alcohol, but not so in water. It melts by heat, and if it be more strongly urged it is totally dissipated. This being endowed with violent powers it is to be cautiously administered.

Sulphur (*sublimatum*). *Sulphur* (*sublimed*).—At a temperature of 600° it totally evaporates. When washed with water it does not alter the colour of litmus.

Veratria. *Veratria.*—Dissolves but slightly in water, more soluble in alcohol, but most in sulphuric æther. It has no smell, and a bitter taste. It is to be cautiously administered.

Zinci Sulphas (*crystalli*). *Sulphate of Zinc* (*crystals*).—Totally dissolved by water. What is thrown down by ammonia is white, and when the ammonia is added in excess it is again dissolved. On the addition of chloride of barium or acetate of lead they are decomposed.

Remarks.—If the sulphate of zinc contain oxide of iron it will be precipitated by the ammonia, but not redissolved by excess of it. If it contain copper, the solution will be rendered blue by ammonia. Chloride of barium gives a precipitate of sulphate of barytes, and acetate of lead one of sulphate of lead, both insoluble in dilute nitric acid.

Zincum. *Zinc.*—Almost entirely dissolved by diluted sulphuric acid. The solution is free from colour. Its other properties as above. The specific gravity is 6·86.

PREPARATIONS AND COMPOUNDS.

ACIDA.

ACIDS.

ACETUM DESTILLATUM.

Distilled Vinegar.

Acetum Distillatum, P.L. 1721 *, P.L. 1746, P.L. 1788.
Acidum Aceticum, P.L. 1809.
Acidum Aceticum Dilutum, P.L. 1824.

Take of Vinegar a gallon;

Let the Vinegar distil in a sand-bath, from a glass retort into a glass receiver. Keep the seven pints first distilled for use.

Remarks.—Vinegar is usually prepared in this country by fermenting an infusion of malt, and hence called *Malt Vinegar*, to distinguish it from that obtained in foreign countries by the renewed fermentation of wine. Malt vinegar is a mixture of acetic acid, to which its sourness is owing; a little alcohol or spirit; colouring matter; a peculiar organic matter which has been called mucilage; and water; the maker is allowed to add to it one thousandth of its weight of sulphuric acid.

The strongest malt vinegar is termed *proof vinegar*, and is estimated to contain 5 per cent. of real acetic acid; it is, however, seldom quite so strong.

Impurities and Tests.—See Notes: Acetum.

Process.—By distillation the vinegar is freed from its colouring

* In the former editions of this Translation the dates of the two first Pharmacopœias were those of the College; for the sake of uniformity, the dates now given are in all cases those of the Order in Council.

matter and sulphuric acid; but the alcohol and a considerable portion of the mucilage rise and are condensed with it; so that distilled vinegar is a mixture of acetic acid, a little alcohol, and mucilage, with water: in the last Pharmacopœia the pint first distilled was ordered to be rejected, but as it contained nearly one-twelfth part of the real acid distilled, it is now directed to be preserved. Of whatever material the body of the still may be made, the head, and worm or condensing pipe, should be of glass or earthenware, so that the distilled product may not come into contact with any metal.

Properties.—Distilled Vinegar is colourless, but its smell and flavour are much less agreeable than before distillation; its taste is flat and empyreumatic, owing probably to the decomposing action of the heat upon the colouring matter and mucilage. A mixture of acetic acid and water, of the proper strength, is now advantageously used for various purposes instead of distilled vinegar, especially in preparing some acetates, as those of potash and soda: when distilled vinegar is saturated with these alkalis, the solution on being heated becomes brown, and deposits a dark-coloured substance, probably derived from the decomposition of the mucilage; this impurity it is difficult and tedious to separate so as to obtain the acetates of potash and soda pure and colourless.

Impurities and Tests.—See Notes: Acetum Destillatum.

Incompatibles.—See Acidum Aceticum.

Pharmacopœia Preparations.—Acetum. Cataplasma Sinapis, Ceratum Saponis, Linimentum Æruginis.

Pharmacopœia Preparations.—Acetum Destillatum. Acetum Colchici, Acetum Scillæ, Emplastrum Ammoniaci, Liquor Ammoniæ Acetatis, Oxymel Scillæ, Unguentum Plumbi Compositum.

ACIDUM ACETICUM.

Acetic Acid.

Acidum Acetosum, P.L. 1788.
Acidum Aceticum Fortius, P.L. 1824.

Take of Acetate of Soda two pounds,
Sulphuric Acid nine ounces,
Distilled Water nine fluidounces;

Add the sulphuric Acid, first mixed with the Water, to the Acetate of Soda put into a glass retort, then let the Acid distil in a sand-bath. Care is to be taken that the heat, towards the end, be not too much increased.

Remarks.—The Materia Medica of the last Pharmacopœia contained *Acidum Aceticum fortius, è ligno destillatum,* the strength of which was very nearly the same as that obtained by the above formula.

Process.—Acetate of Soda is a salt now placed in the Materia Medica; it is made almost exclusively for the preparation of acetic acid in the mode above described. An impure acetic acid, called formerly *pyroligneous acid,* is procured by heating and decomposing wood in iron cylinders; it is rendered impure by various substances, but especially by tarry matter, from which it is partially freed by distillation, and then being combined with soda, the resulting acetate is purified by repeated solution and crystallization.

The crystals of acetate of soda are usually very small; the primary form is an *oblique rhombic prism.* It is colourless, inodorous, and rather sweet to the taste.

It is composed of

One equivalent of Acetic Acid	51	or	37·23
One equivalent of Soda	32	,,	23·37
Six equivalents of Water .. 9 × 6 =	54	,,	39·40
Equivalent	137·		100·

Symbol,—Berzelius and Turner.... $NaO, H^3 C^4 O^3, 6HO.$
Brande .... $(S + ac' + 6q.)$

Sulphuric acid having greater affinity for soda than acetic acid has, the acetate of soda is decomposed; the acetic acid being volatile rises and is condensed with the water, both of the acid and salt, anhydrous sulphate of soda remaining in the retort.

Acidum Aceticum, P.L.

Water and Sulphuric Acid.	Water.	Acetic Acid.	Acetate of Soda.
	Sulphuric Acid.	Soda.	

Sulphate of Soda.

Properties and Composition.—Acetic Acid has never been obtained except in combination with water or with a base; it was formerly, when of the greatest strength, called *radical vinegar.* It is limpid and colourless, its smell is pungent and refreshing, and its taste acrid unless moderately dilute, and then it is agree-

ably acid, and devoid of the empyreumatic flavour of distilled vinegar. Its acid powers are strongly marked by its action on litmus paper, which it reddens, and by its decomposing the carbonates of potash and soda, &c. with effervescence. It is volatile even at common temperatures, and its vapour, especially when arising from heated acid, is inflammable, burning with a white light. Its salts are termed *acetates*; they are decomposed by most acids except the carbonic, and indeed even this happens in one or two cases.

Anhydrous Acetic Acid, as it exists in dry acetate of soda or of potash, &c., is composed of

Three equivalents of Hydrogen	$1 \times 3 = 3$	or	6
Four equivalents of Carbon	$6 \times 4 = 24$	„	47
Three equivalents of Oxygen	$8 \times 3 = 24$	„	47
Equivalent	51.		100

Symbol,—Berzelius and Turner.... $H^3 C^4 O^3$.
Brande .... ac'.

It has been mentioned that acetic acid cannot exist without water or a base; and *glacial* acetic acid, as it has been called, on account of its becoming solid and crystalline at a low temperature, or about 40° of Fahrenheit, is the strongest acetic acid procurable; it consists of

One equivalent of Anhydrous Acetic Acid..	51	or	85
One equivalent of Water	9	„	15
Equivalent	60.		100

Symbol,—Berzelius and Turner .... $H^3 C^4 O^3$, HO.
Brande................ $(ac' + q)$.

One hundred grains of the acetic acid prepared according to the present directions, saturate 87 grains of crystallized carbonate of soda; and as 144 of this salt are equivalent to 51 of real acetic acid, it follows that this acetic acid is composed of

Anhydrous Acetic Acid	30·8
Water	69·2
	100·

A mixture of 15 parts by weight of this acid and 85 of water is equal in strength to distilled vinegar.

Impurities and Tests.—See Notes: Acidum Aceticum.

Incompatibles.—Alkalis, alkaline carbonates, alkaline earths and their carbonates, metallic oxides and most substances acted upon by other acids.

Pharmacopœia Preparations.—Acetum Cantharidis, Extractum Colchici Aceticum, Morphiæ Acetas, Oxymel, Plumbi Acetas, Potassæ Acetas.

Medicinal Uses.—Acetic Acid when diluted is refrigerant, and may be advantageously administered in hæmorrhage; especially in cases where the acetate of lead has been given, since the solubility of this salt is much increased by it. Externally it may be a useful adjunct to lotions containing lead.

ACETUM CANTHARIDIS. (*Epispasticum.*)

Vinegar of Cantharides. (*Epispastic.*)

Take of Cantharides rubbed to powder two ounces,
Acetic Acid a pint;

Macerate the Cantharides with the Acid for eight days, frequently shaking. Lastly, press and strain.

Medicinal Use.—This preparation is now first introduced, and is employed as an extemporaneous blister.

ACETUM COLCHICI.

Vinegar of Meadow Saffron.

Acetum Colchici, P.L. 1809, P.L. 1824.

Take of Meadow Saffron Cormus, fresh, sliced, an ounce,
Distilled Vinegar sixteen fluidounces,
Proof Spirit a fluidounce;

Macerate the Meadow Saffron Cormus with the Vinegar, in a covered glass vessel, for three days; afterwards press and strain [the liquor] and set it by, that the dregs may subside: lastly, add the Spirit to the clear liquor.

Remarks.—It has generally been supposed that the virtue of meadow saffron resides in a peculiar vegetable alkali similar to that contained in white hellebore and called *veratria*; according,

however, to the late experiments of Hesse and Geiger, it is an alkali differing from veratria, and to which they have given the name of *colchicia*.

Colchicia is prepared by digesting the seed of meadow saffron in boiling alcohol, which dissolves a supersalt of this alkali; this is to be precipitated by magnesia, and what is thrown down again treated with boiling alcohol, which by evaporation deposits colchicia. In this process the magnesia combines with the acid previously united with the colchicia, which is precipitated with the excess of magnesia and dissolved in an uncombined state by the second portion of alcohol. Colchicia crystallizes in slender needles; it is inodorous, its taste is first bitter and afterwards biting, but not so acrid as that of veratria, from which it also differs in not exciting sneezing, and in being soluble in water.

Hydrate of Colchicia is feebly alkaline to tests, but it completely neutralizes acids and forms crystallizable salts with them, which veratria does not. Its salts have a bitter taste. The aqueous solution of this alkali precipitates a solution of chloride of platina. Nitric acid turns it deep violet, blue, and afterwards quickly green and yellow. It is very poisonous; a tenth of a grain given to a cat acted violently upon it, and killed it in about twelve hours. It has not been analyzed, but like other vegetable alkalis it is probably composed of hydrogen, carbon, oxygen, and azote.

Incompatibles.—Alkalis, their carbonates, the alkaline earths and their carbonates, or any substances on which vinegar is capable of exerting an action.

Medicinal Use.—As a diuretic, and in the gout. Dose, f℥ss to f℥j in any bland fluid.

ACETUM SCILLÆ.

Vinegar of Squill.

Acetum Scilliticum, P.L. 1721, P.L. 1746.
Acetum Scillæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Squill, recently dried, fifteen ounces,
Distilled Vinegar six pints,
Proof Spirit half a pint;

Macerate the Squill with the Vinegar with a gentle heat, in a closed glass vessel, for twenty-four hours; afterwards press out [the liquor] and set it by, that the dregs may subside; lastly, add the Spirit to the clear liquor.

Remarks.—Squill contains a peculiar vegetable product to which the name of *scillitin* has been given; it is prepared by the action of spirit upon dried squill, evaporating the solution after the alcohol has been distilled from it, and treating the residue again with spirit and with æther. Scillitin is of a bright yellow colour, and is at first obtained in flocks; these soften in hot water and unite into a mass which becomes brown and brittle by drying. Its taste is very acrid and bitter; when heated it fuses, swells and exhales, at first an aromatic odour, and afterwards a urinous smell. It is perfectly soluble in alcohol, but not in æther; dilute acids have no action upon it. A single grain of it is sufficient to kill a large dog. It has not been analyzed.

Incompatibles.—The same as the last preparation.

Pharmacopœia Preparations.—Mistura Cascarillæ Composita, Oxymel Scillæ.

Medicinal Use.—Expectorant and diuretic. Dose fʒss to fʒij in any aromatic distilled water.

ACIDUM BENZOICUM.

Benzoic Acid.

Flores Benzöini, P.L. 1721, P.L. 1746.
Flores Benzoës, P.L. 1788.
Acidum Benzöicum, P.L. 1809, P.L. 1824.

Take of Benzoin a pound.

Put the Benzoin into a proper vessel placed in sand, and the heat being gradually raised, sublime until nothing more rises; press that which is sublimed, wrapped in bibulous paper, and separate it from the oily part; afterwards again sublime it.

Remarks.—Benzoin is a balsam or resinous exudation from the *Styrax Benzoin* of Sumatra; this is the only plant which yields it in sufficient quantity to be worth collecting from, but there are others which afford it in small quantity. When it first exudes it is soft, but it becomes gradually hard by exposure to the air; benzoin is usually met with in fragments of a yellowish or fawn colour, intermixed with pieces of wood and leaves. That which exhibits most white, translucent, friable pieces when broken, is preferred.

The specific gravity of benzoin is about 1·063; it is easily

powdered, has an agreeable odour, and its taste is at first sweetish and afterwards stimulating. It is soluble in alcohol and æther, but not in oils.

According to the analysis of Stolze, two varieties yielded as follows:—

	White Benzoin.	Brown Benzoin.
Yellow resin, soluble in æther	79·83	8·80
Brown resin, insoluble in æther	0·25	69·73
Benzoic acid	19·80	19·70
Extractive	0·00	0·15
Impurities	0·00	1·15
Moisture and loss, and a trace of volatile oil	0·12	0·47
	100·	100·

Process.—Benzoic Acid may be obtained from benzoin by several processes; thus, when it is powdered and boiled in water with lime, the benzoate of that base is formed, which is soluble in water, and is decomposed by hydrochloric acid, which precipitates the benzoic acid; or the powder may be boiled in a solution of about twice its weight of carbonate of soda, by which benzoate of soda is formed; and this may be decomposed with dilute sulphuric acid, which combining with the soda precipitates the benzoic acid, on account of its sparing solubility in water. The simplest and best process is however that by sublimation, as here directed; the benzoic acid is volatilized at a moderate heat, and condenses in the upper and cool part of the apparatus. The oily matter from which the acid is directed to be separated by absorption and pressure, is probably formed by the decomposition of the resin of the benzoin, and a fresh arrangement and combination of its elements.

Properties.—This acid, when pure, is colourless; it crystallizes in soft and rather elastic crystals, which have scarcely any smell; it is however stronger when the acid is prepared by sublimation than by precipitation; its taste is rather aromatic and penetrating than sour; by exposure to the air it suffers no change; it requires two hundred times its weight of cold or twenty-four of boiling water for solution; on cooling a crystalline mass is obtained which has the appearance of fat; alcohol takes it up readily and in large quantity, and by spontaneous evaporation prismatic crystals of the acid are formed. Although the aqueous solution acts but feebly upon litmus paper, the acid nevertheless combines readily with alkalis and metallic oxides, forming salts called *benzoates,* which are but little employed in scientific, and not at all in medical chemistry.

Benzoic acid fuses and sublimes at a moderate heat; if strongly heated it burns with a bright yellow flame; it dissolves in sulphuric or nitric acid without suffering decomposition.

Composition.—Benzoic acid cannot exist without water or a

base; when existing in a benzoate, which is anhydrous, as that of silver, it consists of

Five equivalents of Hydrogen ..	$1 \times 5 =$	5
Fourteen equivalents of Carbon ..	$6 \times 14 =$	84
Three equivalents of Oxygen....	$8 \times 3 =$	24
	Equivalent....	113
The crystals contain One equivalent of Water		9
	Equivalent....	122

Symbol,—Berzelius and Turner (anhydrous) $H^5\ C^{14}\ O^3$.
—————— (crystals) .. $H^5\ C^{14}\ O^3$, HO.
Brande .... (anhydrous) (Ben + *O*).
—— .... (crystals) .. (*ben′* + *q*).

This water cannot be expelled by heat, but may be separated by combining the acid with oxide of silver.

According to the experiments of Wöhler and Liebig, benzoic acid is to be considered as the oxide of a compound inflammable base, which they call *benzule*, and regard as consisting of 14 eqs. of carbon 84, 5 eqs. of hydrogen 5, and 2 eqs. of oxygen 16; its equivalent is consequently 105, which by the addition of one equivalent of oxygen 8, yields, as above, 1 equivalent of anhydrous benzoic acid 113, and this with one equivalent of water 9, constitutes crystallized benzoic acid as already shown.

Benzule is capable of combining with chlorine, sulphur, and some other elementary bodies; with hydrogen and azote it forms *benzamide*; when benzoic acid is heated with hydrate of lime a peculiar fluid is obtained which is called *benzine*; and another product, composed of carbon, hydrogen, and oxygen, called *benzone*, has been formed by heating benzoic acid with lime.

Impurities and Tests.—See Notes: Acidum Benzoicum.

Incompatibles.—Such substances as neutralize or combine with acids in general, as alkalis, their carbonates, metallic oxides, &c.

Pharmacopœia Preparations.—Tinctura Camphoræ Composita. The gum-resin, and of course the benzoic acid which it contains, is also used in the Tinctura Benzoini Composita.

Medicinal Uses.—It is supposed to be stimulant and expectorant, but is rarely used except in the Tinctura Camphoræ Composita.

ACIDUM CITRICUM.

Citric Acid.

Acidum Citricum, P.L. 1809, P.L. 1824.

Take of the Juice of Lemons four pints,
Prepared Chalk four ounces and a half,
Diluted Sulphuric acid twenty-seven fluid-ounces and a half,
Distilled Water two pints;

Add the Chalk gradually to the Juice of Lemons made hot, and mix. Set by, that the powder may subside; afterwards pour off the supernatant liquor. Wash the Citrate of Lime frequently with warm water. Then pour upon it the Diluted Sulphuric Acid and the distilled Water, and boil for a quarter of an hour. Press the liquor strongly through a linen cloth, and strain it. Evaporate the strained [liquor] with a gentle heat, and set it by, that crystals may be formed.

Dissolve the crystals, that they may be pure, again and a third time in water, and as often, strain, boil down, and set it aside.

Remarks.—There are several fruits, as raspberries, gooseberries, &c., which contain citric acid, and in some instances it is associated with malic acid: the juice of lemons may however be considered as an aqueous solution of citric acid nearly free from any other, but mixed with a considerable quantity of mucilage which prevents the acid from crystallizing, although it may be evaporated sufficiently.

Process.—Chalk consists of carbonic acid and lime, and is termed chemically, carbonate of lime; when this is added to the lemon-juice, the citric acid, owing to its greater affinity for the lime than of the carbonic acid for it, expels the carbonic acid with effervescence in the gaseous state. The citrate of lime thus formed being but sparingly soluble in water, most of it remains undissolved, and subsides in the state of a white powder, whilst the greater part of the mucilage of the lemon-juice is held in solution.

The first steps in the operation are then the formation of citrate of lime, and the separation of the mucilage; the aqueous part

of the lemon-juice holding the mucilage in solution is rejected, and the citrate of lime is rendered free from any remains of it by repeated washing.

The citrate of lime when heated with the diluted sulphuric acid is decomposed, on account of the greater affinity existing between sulphuric acid and lime than between citric acid and lime; the sulphate of lime thus formed subsides on account of its slight solubility, and the citric acid remains in solution; by evaporation crystals of citric acid are obtained, which are at first of a brownish colour, but rendered at last colourless by the repeated solution and crystallization directed to be performed.

The operations now described may perhaps be rendered more intelligible by the annexed diagrams:

Lemon Juice	Water & Mucilage.	Carbonic Acid *Gas.*	Chalk.
	Citric Acid.	Lime.	

Citrate of Lime.

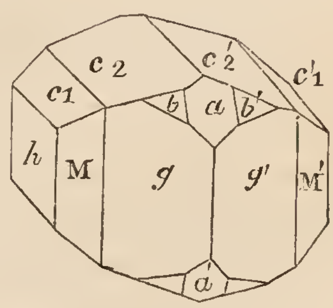
Solution of Citric Acid.

Diluted Sulphuric Acid.	Water.	Citric Acid.	Citrate of Lime.
	Sulphuric Acid.	Lime.	

Sulphate of Lime.

Properties.—Citric Acid is colourless, inodorous, extremely sour; the primary form of the crystal is a *right rhombic prism*, but which usually exhibits the planes described in the annexed figure: M and M′ being the lateral primary planes.

M on M′	....	101° 30′
M on *h*	....	129 15
M on *g*	....	163 23
g on *g*′	....	134 45
a on *a*′	....	111 50
a on *b*	....	161 30
h on c^1	....	139 45
h on c^2	....	121 15
c^1 on c^2	....	161 30
c^2 on c'^2	....	117 30



By exposure to a damp atmosphere the crystals absorb moist-

ure. One hundred parts of citric acid require 75 of cold and 50 parts of boiling water to dissolve them. The solution reddens litmus paper strongly, and like lemon-juice, decomposes and becomes mouldy by keeping. When citric acid is subjected to distillation it yields pyro-citric acid, acetic acid, carbonic acid, empyreumatic oil, carburetted hydrogen gas, and water, and charcoal remains in the retort. When heated with nitric acid it is converted into oxalic acid. One drachm of the crystals of this acid saturates very nearly two drachms of crystallized carbonate of soda. About eleven drachms and a half of citric acid, dissolved in a pint of distilled water, give a solution equal in strength to lemon-juice.

The following table exhibits the quantities, very nearly, of crystallized citric acid, lemon-juice, and solution of citric acid prepared as above, necessary for the decomposition of one scruple of the alkaline salts named:

A Scruple of	*Lemon-Juice or Solution of Citric Acid.*	*Citric Acid.*
Bicarbonate of Potash	fʒiijss	gr. 14.
Carbonate of Potash	fʒiiij	gr. 17.
Sesquicarbonate of Ammonia	fʒvi	gr. 24.

It is to be observed that in the above statements the bicarbonate of potash is considered as crystallized; the carbonate as dry, but containing, as it usually does, about 16 per cent. of water; and the sesquicarbonate of ammonia as translucent and moderately hard; if it be opaque and powdery, the change is owing to the evaporation of neutral carbonate of ammonia, and bicarbonate being formed, its saturating power is less, and to an extent which is uncertain.

Composition.—Citric Acid, like the acetic and benzoic acids, is a compound of hydrogen, carbon, and oxygen; when anhydrous it consists of

Two equivalents of Hydrogen ...	$1 \times 2 =$	2 or	3·44
Four equivalents of Carbon	$6 \times 4 =$	24 „	41·38
Four equivalents of Oxygen	$8 \times 4 =$	32 „	55·18
Equivalent		58.	100·

Symbol,—Berzelius and Turner .... $H^2 C^4 O^4$.
Brande .... cit'.

The crystals of citric acid which deposit on the cooling of a solution saturated at 212°, contain one equivalent of water;

whereas the acid usually met with in commerce consists of 3 equivalents of anhydrous acid and 4 of water; or each equivalent of acid is combined with $1\frac{1}{3}$ equivalent of water.

Three eqs. of anhydrous Acid	$58 \times 3 = 174$	or 1 eq. 58	or 82·86
Four eqs. of Water	$9 \times 4 = \ 36$	„ $\frac{4}{3}$ eq. 12	„ 17·14
Equivalent	210.	70.	100.

Symbol,—Berzelius and Turner ... $H^2 C^4 O^4, 4HO$.
Brande .... $(3cit' + 4q)$.

At 212° these crystals lose half their water, and they then consist of 3 equivalents of acid and 2 equivalents of water, but cannot be deprived of more without suffering decomposition.

Incompatibles.—Citric acid is incompatible with all alkaline solutions and substances, converting them into citrates, as ammonia, potash, soda, lime, magnesia, &c. It decomposes the alkaline, earthy and metallic carbonates, most acetates, the alkaline sulphurets and soaps. It is also incompatible with tartrate of potash, which it converts into citrate and bitartrate of potash.

Impurities and Tests.—See Notes: Acidum Citricum.

Medicinal Uses.—It is employed as a refrigerant, combined with potash or ammonia in the proportions already stated. Half a fluidounce of lemon-juice, or an equal quantity of a solution of citric acid of the same strength so saturated, is generally exhibited as a dose.

ACIDUM HYDROCHLORICUM.

Hydrochloric Acid.

Spiritus Salis, P.L. 1721.
Spiritus Salis Marini Glauberi, P.L. 1746.
Acidum Muriaticum, P.L. 1788, 1809, 1824.

Take of Chloride of Sodium, dried, two pounds,
Sulphuric Acid, twenty ounces,
Distilled Water twenty-four fluidounces;

Add the Acid, first mixed with twelve fluidounces of the Water, to the Chloride of Sodium put into a glass retort. Pour what remains of the Water into a receiver; then, the retort being fitted to it, let the Acid, distilled

in a sand-bath, pass over into this water, the heat being gradually increased.

Process.—The Acidum Hydrochloricum of the Pharmacopœia is an aqueous solution of hydrochloric acid gas; this acid may be obtained in its gaseous state in several modes; first, when equal volumes (or measures) of hydrogen gas and chlorine gas are mixed and exposed to daylight, they combine slowly to form this acid gas; in the sunshine or by the taper or the electric spark, the union is effected instantaneously and with explosion, and the combination occurring without any alteration of volume, there remains hydrochloric acid gas equal in volume to the two measures of the elementary gases employed. The best method of procuring the gas is that of decomposing chloride of sodium by sulphuric acid, diluted with but little water. The changes which take place are these:

Sixty parts of chloride of sodium (common salt) are composed of 36 of chlorine and 24 of the metal sodium; liquid sulphuric acid, the acidum sulphuricum of the Pharmacopœia, consists of 40 of dry acid and 9 of water, and the water is composed of 1 of hydrogen and 8 of oxygen. When these 60 of chloride of sodium, 40 of dry sulphuric acid and 9 of water, act upon each other, the chloride and water are both decomposed; the 36 of chlorine uniting with the 1 of hydrogen form 37 of hydrochloric acid gas, and the 8 of oxygen with the 24 of sodium constitute 32 of oxide of sodium or soda; while the 40 of dry sulphuric acid combining with these 32 of soda form 72 of dry sulphate of soda, which remain in the retort. The use of the water with which the sulphuric acid is diluted will be presently explained.

37 *Hydrochloric Acid Gas.*

60 Chloride of Sodium.	36 Chlorine	1 *Hydrogen* 8 *Oxygen* 9 Water	49 Liquid Sulphuric Acid.
	24 Sodium 8 *Oxygen* 32 *Soda*	40 Dry Sulphuric Acid.	

72 *Dry Sulphate of Soda.*

When this acid is required in its gaseous state, it must, on account of its ready solubility in water, be received in glass jars filled with and inverted in mercury.

Properties.—Hydrochloric Acid Gas is colourless and invisible; at common temperatures, and under the usual pressure, it is permanently elastic; when, however, at the temperature of 50°, it is subjected to a pressure of 40 atmospheres, it is rendered liquid; but when the pressure is removed, it immediately reassumes the gaseous state. Hydrochloric acid gas has a pungent odour, an acid and acrid taste, and is quite irrespirable and uninflammable; it reddens litmus paper strongly, and evinces all the other properties of a powerful acid. It has great affinity for water, and when it escapes into the air combines with the moisture of it so as to form a dense white vapour; a few drops of water introduced into a jar of the gas immediately causes its absorption. Water at 40° is capable of dissolving nearly 480 times its bulk of this gas. It is not altered by heat, but by electricity is partially decomposed.

Composition.—It has been already observed that this compound gas consists of equal volumes of its elementary gases, and

50 cubic inches of Hydrogen gas weigh	1·075 grs.
50 cubic inches of Chlorine gas	38·700 —
100 cubic inches of Hydrochloric Acid gas weigh...	39·775 grs.

Its specific gravity is therefore 1·2830, air = 1.

By weight it is composed of

One equivalent of Hydrogen............	1 or	2·7
One equivalent of Chlorine	36 „	97·3
Equivalent	37.	100·

Analytical proof of the nature of hydrochloric acid gas is derived from heating binoxide of mercury in it; the new products are bichloride of mercury and water, resulting from the double decomposition of the original compounds, and the fresh arrangement and recombination of their elements.

Symbol,—Berzelius and Turner...... H Cl.

Brande .... $(h+c)$, or hc', or m'.

Properties of Solution of Hydrochloric Acid, the Acidum Hydrochloricum of the Pharmacopœia.—The water with which the sulphuric acid is diluted, and that into which the hydrochloric acid gas is passed in the receiver, combine with it and form liquid hydrochloric acid, for brevity's sake usually termed merely hydrochloric acid: its properties are, that when perfectly pure it is a limpid colourless liquid; it emits white suffocating fumes, which turn vegetable blues red, as the gas and liquid acid also do; its taste is strongly sour and acrid; when its specific gravity is 1·16, as directed, it consists of, nearly,

Hydrochloric Acid Gas	34
Water	66
	100.

It acts upon and dissolves several metals, and what occurs when zinc is put into it may serve as an example of its mode of action; the zinc decomposes the acid, and evolving its hydrogen in the gaseous state, it unites with the chlorine to form chloride of zinc.

Hydrochloric Acid. { Hydrogen *Gas.*
Chlorine. Zinc.

Chloride of Zinc.

When, on the other hand, *oxide* of zinc is dissolved in hydrochloric acid, no gas is evolved, but the hydrogen of the decomposed hydrochloric acid combines with the oxygen of the oxide to form water, while the chlorine separated from the hydrogen unites with the zinc separated from the oxygen, and chloride of zinc results as before.

Water.

Hydrochloric Acid. { Hydrogen. Oxygen. } Oxide of Zinc.
Chlorine. Zinc.

Chloride of Zinc.

On account of the reactions above explained, it is now generally admitted that no hydrochlorates of metals or rather of metallic oxides exist.

The vegetable alkalis, such as morphia, contain however oxygen, but it is supposed that no action takes place between this and the hydrogen of the hydrochloric acid, similar to that which occurs with metallic oxides, and therefore hydrochlorates of the vegetable alkalis may be formed and exist.

Hydrochloric Acid. Morphia.

Hydrochlorate of Morphia.

Ammonia is an alkali which does not contain any oxygen at all; this therefore is very commonly regarded as forming a hydrochlorate, neither the acid nor alkali undergoing decomposition.

Hydrochloric Acid. Ammonia.

Hydrochlorate of Ammonia *.

Impurities and Tests.—See Notes: ACIDUM HYDROCHLORICUM.

Incompatibles.—This acid is incompatible with alkalis, most

* Under the head of Liquor Ammoniæ, I have briefly stated some hypothetical opinions as to the nature of Ammoniacal Salts.

earths, oxides, and their carbonates; sulphuret of potassium, tartrate of potash, potassio-tartrate of antimony, nitrate of silver, acetates of lead, &c.

Pharmacopœia Preparations.—Acidum Hydrochloricum Dilutum, Barii Chloridum, Calcii Chloridum, Calx Chlorinata, Liquor Barii Chloridi, Liquor Calcii Chloridi, Ferri Ammonio-chloridum, Morphiæ Hydrochloras, Tinctura Ferri Ammonio-chloridi, Tinctura Ferri Sesquichloridi.

Pharmacopœia Uses.—Acidum Hydrocyanicum, Acidum Tartaricum, Antimonii Potassio-tartras, Carbo Animalis purificata.

Medicinal Uses.—According to Dr. Paris, it may be advantageously employed in malignant cases of scarlatina and typhus; and mixed with a strong infusion of quassia, he considers it to be the most efficacious remedy for preventing the generation of worms.—Dose ♏v to ♏xx, frequently repeated.

ACIDUM HYDROCHLORICUM DILUTUM.

Diluted Hydrochloric Acid.

Take of Hydrochloric Acid four fluidounces,
Distilled water twelve fluidounces;
Mix.

Medicinal Use.—See ACIDUM HYDROCHLORICUM.
Dose of Acidum Hydrochloricum Dilutum ♏xx to fʒj.

ACIDUM HYDROCYANICUM DILUTUM.

Diluted Hydrocyanic Acid.

Take of Ferrocyanide of Potassium two ounces,
Sulphuric Acid an ounce and a half,
Distilled water a pint and a half;

Mix the Acid with four fluidounces of the water, and to these, when cooled and put into a glass retort, add the Ferrocyanide of Potassium first dissolved in half a pint of the water. Pour eight fluidounces of the water into a cooled receiver; then, the retort being fitted on, let six fluidounces of Acid pass into this water, distilled with a gentle heat in a sand-bath. Lastly, add six more fluidounces of distilled water, or as much as may be sufficient,

that 12·7 grains of nitrate of silver dissolved in distilled water, may be accurately saturated by 100 grains of this Acid.

Diluted Hydrocyanic Acid may be otherwise prepared, when it is to be more quickly used, from forty-eight grains and a half of Cyanide of Silver, added to a fluidounce of distilled water, mixed with thirty-nine grains and a half of Hydrochloric Acid. Shake all these in a well-stopped vial: and after a short interval pour off the clear liquor into another vessel. Keep this for use, the access of light being prevented.

Remarks.—This acid was first obtained by Scheele in 1782, and as it was procured, though intermediately, from Prussian blue, it was originally called Prussic acid; its present appellation was given to it for reasons presently to be stated. It appears extremely probable that this acid exists ready formed in several vegetable products; for when the leaves of the cherry laurel, the peach tree, or when bitter almonds and some other substances are subjected to distillation, the distilled fluid has the peculiar smell of hydrocyanic acid, and produces, after a certain time, Prussian blue when added to a saturated solution of iron in carbonic acid. It is however possible that the hydrocyanic acid thus obtained is a product and not an educt, and then its elements only exist in the substances which yield it by distillation; in the mode, however, in which it is here directed to be prepared, it is unquestionably entirely an artificial product.

Ferrocyanide of Potassium is a well-known salt, frequently called *prussiate of potash*, or *prussiate of potash and iron.* It is prepared by heating to redness a mixture of animal matter, such as hoofs, horns, or blood, and potash in an iron vessel. By their mutual decomposition and action on the iron, a coaly mass is obtained, which is partially soluble in water, and the solution by evaporation yields large translucent crystals of a fine yellow colour; the primary form of which is an octahedron with a square base. This salt is inodorous; its taste is rather saline; water at 60° dissolves about one third, and at 212° its own weight of this salt: it is insoluble in alcohol; when moderately heated it loses about 13 per cent. of water, and becomes colourless; when heated to redness with access of air it suffers partial decomposition; the residue, when put into water, leaves oxide of iron, and cyanide of potassium is dissolved; but if the heat be longer continued, then hydrocyanic acid and ammonia are evolved, and the residue

consists entirely of carbonate of potash and sesquioxide of iron. When the aqueous solution of ferrocyanide of potassium is mixed with one of a protosalt of iron, a white precipitate is formed, which speedily becomes blue by exposure to the air; and this, as well as the blue precipitate obtained at once from the salts of sesquioxide of iron, is Prussian blue, or the percyanide of iron.

Composition.—This salt may be regarded under two points of view; first, as consisting of ultimate elements; and secondly, as formed of compounds of these elements. According to Berzelius, by ultimate analysis it yields:

Six equivalents of Carbon...	6×6	$= 36$	or 16·94
Three equivalents of Azote..	14×3	$= 42$	„ 19·76
One equivalent of Iron		28	„ 13·14
Two equivalents of Potassium	40×2	$= 80$	„ 37·54
Three equivalents of Water..	9×3	$= 27$	„ 12·62
Equivalent		213.	100·

The experiments of Gay-Lussac have, however, rendered it more than probable that the carbon and azote exist in combination, forming a distinct compound which he terms *cyanogen*, from Greek words signifying to *generate blue,* because it is necessary to the production of Prussian blue. Cyanogen is obtained by heating bicyanide of mercury in a retort: the properties of cyanogen are that it is gaseous, colourless, and transparent, its smell is penetrating, and somewhat resembles that of bitter almonds. A taper immersed in it is extinguished, but it burns at the surface where it is in contact with the oxygen of the air; the flame has a peculiar and characteristic purple colour, and the results of the combustion are azotic gas and carbonic acid gas.

The specific gravity of cyanogen gas is to that of air as 1·806 to 1; 100 cubic inches weigh 55·9 grains; water dissolves about 4·5 volumes of this gas, and alcohol 23 volumes; when exposed to a temperature of 45°, under a pressure of between 3 and 4 atmospheres, this gas was reduced by Mr. Faraday to a fluid rather lighter that water. It is composed of

Two equivalents of Carbon	6×2	$= 12$
One equivalent of Azote		14
Equivalent		26

It is therefore a Bicarburet of Azote.

Supposing, then, that the carbon and azote exist as cyanogen combined with the metals, the ferrocyanide of potassium consists of

One equivalent of Cyanide of Iron	$26 + 28$	$= 54$
Two equivalents of Cyanide of Potassium .	$52 + 80$	$= 132$
Three equivalents of Water	9×3	$= 27$
Equivalent		213

Process.—Although cyanogen is capable of uniting with various elementary bodies, as with hydrogen, oxygen, and chlorine, yet this union does not take place by direct action; it is therefore requisite to have recourse to intermediate action, so as to present these gases to each other in their nascent state.

Several processes have been suggested for preparing hydrocyanic acid; the first I shall notice is that adopted in the Pharmacopœia. It appears from the experiments of Mr. Everitt (London and Edinburgh Phil. Mag., Feb. 1835), that when 6 equivalents of sulphuric acid are heated with 2 equivalents of ferrocyanide of potassium, the action that ensues is as follows: Two equivalents of ferrocyanide of potassium contain 4 eqs. of cyanide of potassium, of which only 3 eqs. are decomposed, as are also 3 eqs. of water, the 3 eqs. of oxygen of which combine with 3 eqs. of potassium and form 3 eqs. of potash, which unite with the 6 eqs. of sulphuric acid to form 3 eqs. of bisulphate of potash; the 3 eqs. of hydrogen of the decomposed water unite with the 3 eqs. of cyanogen separated from the potassium and constitute with them 3 eqs. of hydrocyanic acid. There remain undecomposed 1 eq. of cyanide of potassium, and the 2 eqs. of cyanide of iron, and these combining form, what is called by the chemist above quoted *yellow salt*, the constitution of which, it will be observed, is precisely the converse of that of the ferrocyanide of potassium, with respect to the proportions of the cyanides.

The annexed statement will show how, according to Mr. Everitt, the various constituents of the acid and salt are disposed of, except, indeed, that the quantity of water distilled with the hydrocyanic acid is not given:

Submitted to Distillation.		*Results of Distillation.*	
6 eqs. Sulphuric Acid	240	3 eqs. Bisulphate of Potash	384
4 — Cyanide of Potassium	264	3 — Hydrocyanic Acid	81
2 — Cyanide of Iron	108	1 — Cyanide Potassium 66 } Yellow Salt	174
12 — Water { 6 in the Acid, 6 in the Salt }	108	2 — Cyanide Iron ...108 }	
		9 — Water	81
	720		720

It will be noticed, that the proportions of sulphuric acid and ferrocyanide of potassium here mentioned do not differ much from those in the Pharmacopœia; but a large quantity of water is used with them in the latter case, to prevent the waste of hydrocyanic acid which would occur, for want of condensation, without it.

I shall briefly notice the process employed by Gay-Lussac to prepare this acid, because it is that by which it is procured of the greatest strength, and consequently best exhibits its peculiar properties. He put into a retort some bicyanide of mercury, to which he adapted a tube of about two feet in length, and half an inch in diameter; one third of this tube, and that nearest the retort, had pieces of marble put into it, while the remaining

two thirds were occupied with chloride of calcium. On the bicyanide of mercury were poured about two thirds of its weight of concentrated hydrochloric acid, and a gentle heat was applied. Any undecomposed hydrochloric acid was stopped by the marble, and all moisture by the chloride of calcium. During this operation the chlorine of the hydrochloric acid combines with the mercury of the bicyanide to form bichloride, which remains in the retort, while the hydrogen of the hydrochloric acid takes the cyanogen of the bicyanide, and these forming hydrocyanic acid, it is vaporized, and afterwards condensed in the receiver cooled by ice. Any portion of the hydrocyanic acid which may be condensed on the fragments of marble is to be volatilized by a gentle heat and sent in vapour to the receiver.

The properties of the acid thus obtained are, that it is a colourless liquid with a strong odour; its taste is first cooling and afterwards burning, and it is very poisonous. Its specific gravity is 0·6969; it boils at about 80°, becomes solid at 5° of Fahrenheit, and crystallizes in fibres like nitrate of ammonia. It acts feebly as an acid, but reddens litmus paper, the blue colour of which returns as the acid evaporates. It is extremely volatile, and when a drop on paper is exposed to the air, the evaporation of a part of it renders the remainder so cold that it solidifies; and this effect is produced even when the temperature of the air is 68°. The specific gravity of its vapour is to atmospheric air as 0·9363 to 1. It combines with water and alcohol in all proportions.

It forms but few salts on account of the facility with which it decomposes, and is very subject to spontaneous decomposition, and especially if exposed to light, even when kept in well-stopped bottles; this is owing to the tendency of its elements to form new combinations. The first indication of decomposition is that the acid becomes of a brown tint, which gradually gets deeper, and eventually ammonia is formed and a black powder subsides; this contains carbon and azote, and it has been supposed to be a peculiar acid composed of hydrogen, carbon, and azote, and has been called azulmic acid. When diluted with water, and especially if a little hydrochloric acid be added, the decomposition is much retarded.

The above-mentioned are the properties of real or anhydrous hydrocyanic acid; that of the Pharmacopœia, which contains only two per cent. of it, possesses them of course in a much lower degree.

Composition.—Regarding it as a ternary compound, hydrocyanic acid consists of

One equivalent of Hydrogen ..		1	or 3·7
Two equivalents of Carbon	$6 \times 2 =$	12	„ 44·4
One equivalent of Azote		14	„ 51·9
Equivalent		27.	100·

It is, however, usually considered as a compound of hydrogen and cyanogen, and hence the name of hydrocyanic acid.

One equivalent of Hydrogen	1	or	3·7
One equivalent of Cyanogen	26	„	96·3
Equivalent	27.		100·

In the elastic state or that of vapour, it may be further regarded as composed of

	50	cubic inches of hydrogen gas, weighing..	1·075 gr.
	50	cubic inches of cyanogen gas, weighing..	27·950 grs.
and as these combine without condensing,	100	cubic inches of hydrocyanic acid vapour weigh	29·025 grs.

I shall give the symbols of all the compounds, which I have had occasion to describe, at one view:

Ferrocyanide of Potassium:—

Berzelius and Turner..2KCy; Fe Cy; 3HO.

Brande ....$(fe + cy) + 2(po + cy) + 3q$.

Hydrocyanic Acid:—

Berzelius and Turner..HCy.

Brande ....$(cy + h)$, or hcy'.

Yellow Salt:—

Berzelius and Turner..KCy; 2FeCy.

Brande ....$(2fe + cy) + (po + cy)$.

Incompatibles.—When added to salifiable bases it is in most cases decomposed on account of the slight affinity with which its elements are held in combination; so that when mixed with metallic oxides its hydrogen is usually transferred to their oxygen, and the result is not a hydrocyanate of an oxide, but water and a metallic cyanide.

Substituting hydrocyanic acid for hydrochloric acid, and consequently cyanogen for chlorine, the statements and diagrams which illustrate the action of hydrochloric acid upon metals, their oxides, and other bases, will serve to explain that of the hydrocyanic acid also. See p. 66.

Impurities and Tests.—See Notes: Acidum Hydrocyanicum.

The process introduced for preparing hydrocyanic acid extemporaneously was first proposed by Mr. Everitt; th changes

which occur are these: the hydrochloric acid is composed of hydrogen and chlorine, and the cyanide of silver, as its name imports, of cyanogen and silver; when these are mixed double decomposition ensues, and the results are chloride of silver which remains insoluble, and hydrocyanic which is held in solution and poured off when clear. The reaction is explained by the annexed diagram.

Hydrocyanic Acid.

Hydrochloric Acid. — Hydrogen. Cyanogen. — Cyanide of Silver.

Chlorine. Silver.

Chloride of Silver.

Pharmacopœia Preparation.—Argenti Cyanidum.

Medicinal Uses.—Hydrocyanic Acid has been thought by Magendie, who chiefly introduced it into use, to act as a sedative without possessing the stimulating property of opium. It has been used to allay gastric and pulmonary irritation; in the former, when proceeding from dyspepsia or functional disorder of the stomach, as well as in cancerous affections; and in the latter, to allay cough, and the first symptoms of tubercles in the lungs. Great caution should be observed in its use, and the dose at first should not exceed five or six minims, which may be increased according to the prudence and judgment of the practitioner. It has likewise been employed in convulsions and spasmodic affections, as hooping-cough and asthma.

ACIDUM NITRICUM.

Nitric Acid.

Aqua Fortis Simplex. Aqua Fortis Duplex, P.L. 1721.
Spiritus Nitri Glauberi, P.L. 1746.
Acidum Nitrosum, P.L. 1788.
Acidum Nitricum, P.L. 1809, P.L. 1824.

Take of Nitrate of Potash, dried,
Sulphuric Acid, each two pounds;

Mix in a glass retort, then let the Acid distil in a sand-bath.

Process.—The quantities of nitrate of potash and *densest* sulphuric acid directed to be used, are nearly in the proportion of one equivalent of the salt to two equivalents of the acid: and if we employ sulphuric acid of specific gravity 1·8433, which is more commonly met with, the equivalent proportions are still more nearly those above stated; or we may consider two equivalents of the salt and four of the acid as submitted to distillation, which will be more convenient in explanation.

Two hundred and four parts of nitrate of potash, or 2 eqs., are composed of 108 of dry nitric acid and 96 of potash; 205 parts of sulphuric acid, or 4 eqs., consist of 160 of dry acid and 45 of water. When these 204 of the salt and 205 of the acid are mixed and heated, double decomposition occurs;—the 96 of potash = 2 equivalents, combine with 160, the 4 equivalents of dry sulphuric acid and 18 = 2 equivalents of water, and form 274 = 2 equivalents of (bihydrated) bisulphate of potash, which remain in the retort:—the 108 = 2 equivalents of dry nitric acid rise in vapour and combine with 27=3 equivalents of the water, and are condensed in the receiver forming 135=2 equivalents of liquid nitric acid, Acidum Nitricum P.L.

135 *Liquid Nitric Acid.*

204 Nitrate of Potash.	108 Dry Nitric Acid.	27 Water.		
			45 Water.	205 Liquid Sulphuric Acid.
	96 Potash.	18 Water.	160 Dry Sulphuric Acid.	

274 *Bisulphate of Potash.*

The process is improved by omitting the rectification of the acid, which was directed in the last Pharmacopœia. Nitric acid of sp. gr. 1·5033 to 1·504, as obtained by this method, is, I believe, the strongest procurable; and as two equivalents of the dry acid require three equivalents of water for their condensation, this circumstance will explain the reason for using so much sulphuric acid, on account of the water it contains, when means are not provided for condensing the nitric acid by passing it into water in a Woulfe's apparatus; which is the method practised by those who prepare this acid for manufacturing purposes; and using iron retorts and a high degree of heat, they employ only half the quantity of sulphuric acid.

Properties.—Liquid Nitric Acid, usually called merely nitric acid, is a dense colourless fluid; it emits white disagreeable fumes; its taste is extremely sour and acrid, and the skin is in-

delibly tinged of a yellow colour by it. When exposed to the air, it attracts water, for which it has considerable affinity; and when they are suddenly mixed, heat is evolved.

Nitric Acid has usually a yellowish tint, owing to the presence of a small and unimportant quantity of nitrous acid, formed by the partial decomposition of a little of the nitric acid during its preparation. If the coloured nitric acid be moderately heated in a retort, nitric oxide is expelled, and it is rendered colourless. By exposure to light, and especially to the direct rays of the sun, nitric acid becomes first of a straw colour, and then of a deep orange; this change is owing to the evolution of oxygen, and the consequent formation of nitrous acid. If concentrated, it does not act upon the metals in general, at ordinary temperatures, nor on some of them even when boiled in it; but when a little water is added, most of them decompose a portion of the acid, and of the water also; and the metals combining with the oxygen of both, they are either oxidized and become insoluble, or are dissolved and converted into nitrates by the nitric acid remaining undecomposed; during this action nitric oxide gas (nitrous gas) is given out, which uniting with the oxygen of the air, forms red nitrous acid gas. Nitric acid is decomposed by some combustible bodies with great rapidity, as by charcoal, phosphorus, and sugar.

Composition.—Anhydrous Nitric Acid, as it exists in nitrate of potash and other anhydrous nitrates, is composed of

Five equivalents of Oxygen . .	$8 \times 5 =$ 40	or	74
One equivalent of Azote	14	,,	26
Equivalent. . . .	54.		100

Or it may be considered as consisting of

Five volumes of Oxygen Gas,
Two volumes of Azotic Gas.

The elements of nitric acid are incapable of existing in the proportions above stated, unless combined with a base, as with potash, forming nitrate of potash, or with water, constituting liquid nitric acid: this, when of the greatest strength, or of sp. gr. 1·5033 to 1·504, is composed of

Two equivalents of Nitric Acid	$54 \times 2 =$ 108	or	80
Three equivalents of Water . .	$9 \times 3 =$ 27	,,	20
Equivalent. .	135.		100

It is however more convenient in practice, to consider liquid nitric acid of this strength as a sesquihydrate and composed of

One equivalent of Nitric Acid.	54	or	80
One and a half equivalent of Water. .	13·5	,,	20
Equivalent. .	67·5.		100

Symbol,—(Anhydrous Acid) Berzelius and Turner. . NO^5.
Brande .... n'.

(Liquid Acid) Berzelius and Turner NO^5, $1\frac{1}{2}$ HO.
Brande .... $({}_2n' + 3q)$, or $(1n' + 1\frac{1}{2}q)$.

Adulteration.—If pure nitrate of potash be employed in the College process, the nitric acid obtained is perfectly free from all admixture except a little nitrous acid, which, as already noticed, is quite unimportant. The impurities usually occurring in the nitric acid of the shops are the sulphuric and hydrochloric acids.—See Notes: ACIDUM NITRICUM.

Incompatibles.—It has been before observed, that, when moderately diluted, this acid is readily decomposed by most metals; but it has no action upon platina or gold, and they, of course, do not decompose it. When mixed with hydrochloric acid, both suffer decomposition, and chlorine and nitric oxide result. The mixture is called either aqua regia or nitro-hydrochloric acid, and the chlorine evolved possesses the power of dissolving both platina and gold. The action of combustible bodies upon this acid has been adverted to. It is incompatible with sulphate of iron, the protoxide of which decomposes it, and combining with its oxygen, becomes sesquioxide, and the colour of the solution of iron changes from bluish green to yellowish red. It acts strongly upon spirit of wine, and by their mutual decomposition hyponitrous æther is formed (*Spiritus Ætheris Nitrici*). Oxides, earths, alkalis, and their carbonates, are incompatible with this acid, and sulphurets are decomposed by it. It decomposes the solution of acetate of lead and acetate of potash, expelling the acetic acid, and forming nitrate of lead and nitrate of potash.

Pharmacopœia Preparations.—Acidum Nitricum Dilutum, Argenti Nitras, Bismuthi Trisnitras, Spiritus Ætheris Nitrici, Unguentum Hydrargyri Nitratis.

Pharmacopœia Uses.—Acidum Phosphoricum Dilutum, Hydrargyri Nitrico-oxydum. It is sometimes employed externally as an escharotic.

Medicinal Uses.—See Acidum Nitricum Dilutum.

ACIDUM NITRICUM DILUTUM.

Diluted Nitric Acid.

Acidum Nitrosum Dilutum, P.L. 1788.
Acidum Nitricum Dilutum, P.L. 1809, P.L. 1824.

Take of Nitric Acid a fluidounce,
Distilled Water nine fluidounces;
Mix.

Composition and Strength.—The specific gravity of the Acidum Nitricum Dilutum is 1·080; a fluidrachm, weighing 59 grains, contains 8·4 grains of the concentrated acid, and saturates 18·2 grains of crystallized carbonate of soda. A fluidrachm of the Acidum Nitricum weighs 82 grains, and saturates 178 grains of the carbonate; the strength, therefore, of the diluted acid is to that of the concentrated, very nearly, as 10 to 97 by measure, and as 10 to 70 by weight.

Medicinal Use.—This acid is a very powerful antiphlogistic remedy, and is probably serviceable in restraining the progress of syphilis, when an impaired constitution or other circumstances render the exhibition of mercury improper. If sufficiently diluted, it forms an excellent lotion for old indolent ulcers. It is expectorant, and is occasionally used with success in counteracting the consecutive effects of opium. Dose ♏x to ♏xl.

ACIDUM PHOSPHORICUM DILUTUM.

Diluted Phosphoric Acid.

Take of Phosphorus an ounce,
Nitric Acid four fluidounces,
Distilled Water ten fluidounces;

Add the Phosphorus to the Nitric Acid mixed with the water in a glass retort placed in a sand-bath; then apply heat, until eight fluidounces are produced [distilled]. Put these again into the retort that eight fluidounces may distil, which are to be rejected. Evaporate the remaining liquor in a capsule made of platina, until of the whole, only two ounces and six drachms remain. Lastly, add to the Acid, when it has cooled, as much distilled water as may be sufficient to make it accurately measure twenty-eight fluidounces.

Remarks.—Phosphorus is a well-known elementary body, which combines readily with oxygen to form one oxide and several acids; of the acids the best known and most important is the phosphoric acid, and it is formed when phosphorus is burnt in oxygen gas, or atmospheric air; when united with bases it constitutes some of the salts of the animal fluids, and combined with lime it forms phosphate of lime, almost the whole of the harder

portion of bone. Phosphorus is procured from the phosphoric acid of burnt bones, by treating them with dilute sulphuric acid, which, combining with the greater part of the lime, separates the phosphoric acid, or rather a superphosphate of lime ; by evaporating the solution of which, and treating the residue with charcoal in a retort at a high temperature, the phosphoric acid loses its oxygen, and the phosphorus being vaporized is condensed in water.

Phosphorus is solid, translucent and nearly colourless, or slightly yellow ; it is so soft that it may be indented by the nail and very easily cut. Its specific gravity is 1·770. It fuses at about 108°, and at 550° it is vaporized ; it is insoluble in water or alcohol, but dissolved by æther and by oils. It is extremely inflammable, and has been known to take fire in the air spontaneously when its temperature was not above 60° ; on this account it is always kept in water ; it undergoes slow combustion when exposed to the air, and hence is luminous in the dark, and it emits a disagreeable garlic-like smell.

Process.—Nitric acid, as has been already explained, is a compound of oxygen and azote, which, when exposed to, and especially if heated with, certain bodies that have a powerful affinity for oxygen, it is decomposed by them. This is particularly the case with phosphorus, which if added to strong nitric acid decomposes it with explosion and rapid combustion. When diluted nitric acid is used, as here directed, the action is slow, the phosphorus gradually melts, separates the acid into oxygen, with which it combines, and nitric oxide gas, which is evolved. A portion of the nitric acid distils before the whole of the phosphorus is acidified, and hence the necessity of returning it into the retort as ordered. The reaction which occurs is explained by the annexed diagram, premising that although nitric acid is decomposed, the decomposition is not total but partial, so that whilst part of the oxygen combines with phosphorus, another portion of it goes off in combination with the azote of the nitric acid, as nitric oxide gas.

$$\text{Nitric Acid.}\left\{\begin{array}{l}\text{Nitric Oxide } \textit{Gas.}\\ \\ \underbrace{\text{Oxygen.} \qquad\qquad \text{Phosphorus.}}_{\textit{Phosphoric Acid.}}\end{array}\right.$$

Properties.—The Phosphoric Acid obtained by the above process is a colourless, inodorous, sour fluid ; it acts strongly upon litmus paper, and evinces powerful acid properties by the permanent saline compounds which it forms with alkalis, earths, and metallic oxides ; although evaporated so as to become a very

dense fluid, it does not destroy animal or vegetable fibre like sulphuric acid. Even when heated to redness it does not lose all its water, but is converted into metaphosphoric acid.

Phosphoric Acid combined with soda forms phosphate of soda, a well-known purgative salt. When lime-water is added to phosphoric acid an insoluble phosphate of lime is precipitated. The phosphates of barytes, strontia, lead, &c. are insoluble in water, but differ from the sulphates of these bases in being soluble in dilute nitric acid. The phosphates give a yellow precipitate with nitrate of silver, which is phosphate of silver; but if the phosphate of soda be heated to redness before it is dissolved in water, it gives a white precipitate with nitrate of silver, which is pyrophosphate of silver.

Composition.—Phosphoric Acid is composed of

Five equivalents of Oxygen	$8 \times 5 = 40$	or 55·5
Two equivalents of Phosphorus...	$16 \times 2 = 32$	„ 44·4
Equivalent......	72.	99·9

It is however more convenient to regard it, as is usual, except by foreign chemists, as constituted of

Two and a half equivalents of Oxygen	20
One equivalent of Phosphorus..................	16
Equivalent......	36

Symbol,—Berzelius and Turner ... $PO^{2\frac{1}{2}}$.
Brande .... *p'*.

Impurities and Tests.—See Notes: ACIDUM PHOSPHORICUM DILUTUM.

Incompatibles.—Alkalis, earths, metals, and metallic oxides, and such other substances and salts as are incompatible with acids in general.

Medicinal Uses.—Phosphoric Acid possesses the tonic properties of Sulphuric Acid, and is preferable to it in point of flavour. It has also been used with advantage to correct those morbid states of the system in which a tendency exists to unusual depositions of phosphate of lime, such as in cases of exostosis, or formation of bony tumors, as well as in some forms of urinary concretions.

Dr. Paris (Appendix to the Pharmacologia) states, that he has found it to assuage the thirst so commonly present in diabetes, more effectually than any other acidulated drink. Dose ♏xx to f℥j.

ACIDUM SULPHURICUM DILUTUM.

Diluted Sulphuric Acid.

Spiritus Vitrioli Tenuis, P.L. 1746.
Acidum Vitriolicum Dilutum, P.L. 1788.
Acidum Sulphuricum Dilutum, P.L. 1809, P.L. 1824.

Take of Sulphuric Acid a fluidounce and a half,
Distilled Water fourteen fluidounces and a half;
Add the Acid to the Water gradually, and mix.

Remarks.—Anhydrous Sulphuric Acid, sometimes called real or dry sulphuric acid, to distinguish it from the liquid acid which contains water, is composed of

Three equivalents of Oxygen $8 \times 3 = 24$		or	Oxygen ..	60
One equivalent of Sulphur ..	16	„	Sulphur ..	40
Equivalent....	40.			100

Liquid Sulphuric Acid, most frequently termed, as in the Pharmacopœia, merely Sulphuric Acid, and often Oil of Vitriol, consists of

One equivalent of anhydrous Sulphuric Acid..	40	or	81·6
One equivalent of Water	9	„	18·4
Equivalent....	49.		100·

Symbol,—(Anhydrous Acid) Berzelius and Turner.. SO^3.
Brande .... s'.

(Liquid Acid) Berzelius and Turner.... SO^3,HO.
Brande .... $(s'+q)$.

The specific gravity of liquid sulphuric acid at 62° of Fahrenheit is to that of water nearly as 1·845 to 1·000; if it exceed this, its usual purity may be questioned; generally however it is only about 1·8433, and then it is constituted very nearly of

Four eqs. of anhydrous Acid ..	160	or	1 eq.	40	 78
Five eqs. of Water	45	„	$1\frac{1}{4}$ eq.	$11\frac{1}{4}$	 22
	205.		Equiv..	$51\frac{1}{4}$	100.

My observations in some cases apply to acid of the last-mentioned strength.

Properties of Liquid Sulphuric Acid.—This acid is colourless, transparent, inodorous, and of an oily consistence: it is highly acrid and corrosive; its acid reaction is extremely strong, so that a single drop gives to a large quantity of water the power of reddening vegetable blue colours; but when undiluted it has the property of turning vegetable yellow colours brown, as the alkalis do, but the brown colour is removed by water. Its boiling point is about 545°, and it solidifies at 15° below zero.

Sulphuric Acid has great affinity for water. By exposure to the air, in an open vessel, it imbibes one-third of its weight in 24 hours, and more than six times its weight in a twelvemonth. When one part of water is suddenly mixed with four times its weight of concentrated sulphuric acid, both at the temperature of 50°, it is raised to 300°; but according to Dr. Ure, the greatest heat is excited by mixing 73 parts of acid with 27 of water; and these are in the proportion of one equivalent of acid to two equivalents of water; mixtures of sulphuric acid and water occupy less space than before combination.

Concentrated sulphuric acid acts very slowly upon the metals at ordinary temperatures; but at a boiling heat many of them decompose it, and are oxidized by combining with a portion of its oxygen, while sulphurous acid is given out in the gaseous state. When diluted, it rapidly dissolves those metals which decompose water by its agency, as iron and zinc, with the evolution of hydrogen gas, and it dissolves the oxides of most other metals. It readily combines with the alkalis and earths, and forms with them various important salts.

Most vegetable and animal substances, on account of the carbon they contain, are decomposed by and decompose sulphuric acid; and this renders the acid of a dark colour. Although sulphuric acid ought to be colourless, yet the brown tint which it often acquires from the circumstance just mentioned, does not, absolutely, indicate any material deterioration of quality or reduction of strength.

Sulphuric acid acts upon alcohol; and the nature of the product depends upon the relative proportions employed. If equal weights of the acid and rectified spirit be heated in a retort, the product is sulphuric æther; when two of acid and one of spirit are used, æthereal oil is obtained; and when the proportions are 7 acid to 1 spirit, olefiant gas is plentifully formed.

Pharmacopœia Preparations.—Sulphuric Acid enters into the composition of Acidum Sulphuricum Dilutum, Ferri Sulphas, Oleum Æthereum, Potassæ Sulphas, Potassæ Bisulphas, Quinæ Disulphas, Sodæ Sulphas, Zinci Sulphas.

Pharmacopœia Uses.—It is employed in preparing Acidum Aceticum, Acidum Hydrochloricum, Acidum Hydrocyanicum Dilutum, Acidum Nitricum, Æther Sulphuricus, Hydrargyri Bi-

chloridum, Hydrargyri Chloridum, Liquor Sodæ Effervescens, Liquor Sodæ Chlorinatæ, Potassæ Bicarbonas, Sodæ Sesquicarbonas.

Pharmacopœia Preparation, containing *Acidum Sulphuricum Dilutum*, Infusum Rosæ Compositum.

Pharmacopœia Uses of *Acidum Sulphuricum Dilutum*, Acidum Citricum, Acidum Tartaricum, Aconitina, Antimonii Oxysulphuretum, Strychnia, Veratria.

Incompatibles.—All substances that combine with, or are acted upon by, this acid, are of course incompatible with it; such, as already mentioned, are most of the metals, their oxides, some of the earths, their carbonates, and the alkaline carbonates. The solutions of acetate of lead and of chloride of calcium are decomposed by it, white precipitates of sulphate of lead and sulphate of lime being obtained. Its presence is detected by the action of barytic salts, with the base of which it forms sulphate of barytes, soluble only in concentrated sulphuric acid.

Adulteration.—Sulphuric acid always contains sulphate of lead, derived from the chambers in which it is manufactured, and sometimes sulphate of potash: these impurities generally amount to about 1-4th of a grain per cent. When water is added to the acid, the sulphate of lead is precipitated in the state of a white insoluble powder, from which the diluted acid should be poured off for use. If sulphate of potash should be fraudulently mixed with the acid, for the purpose of increasing its specific gravity, the best method of detecting it is to saturate the acid with ammonia, and expel the sulphate of ammonia formed, by putting it into a crucible and subjecting it to a red heat; the sulphate of potash will remain in the crucible.

Medicinal Uses.—It possesses the refrigerant and antiseptic virtues common to other acids; and it has astringent properties that render it a most valuable medicine in weakness and relaxation of the digestive organs, in colliquative sweats and in internal hæmorrhage. The specific gravity of the Acidum Sulphuricum Dilutum is about 1·11; a fluidrachm contains nearly 10 grains of the strong acid, and will saturate 28 grains of crystallized carbonate of soda. Dose ♏x to ♏xl. See Infusum Rosæ.

Comparative saturating power of the Diluted Acids.

One fluidrachm of each of the under-mentioned diluted acids, saturates, almost exactly, the annexed quantity of crystallized Carbonate of Soda:

Acidum Hydrochloricum Dilutum	32 grains.
Acidum Nitricum Dilutum	18·3
Acidum Phosphoricum Dilutum	24·4
Acidum Sulphuricum Dilutum	28

ACIDUM TARTARICUM.

Tartaric Acid.

Acidum Tartaricum, P.L. 1824.

Take of Bitartrate of Potash four pounds,
Distilled Water, boiling, two gallons and a half,
Prepared Chalk twenty-five ounces and six drachms,
Diluted Sulphuric Acid seven pints and seventeen fluidounces,
Hydrochloric Acid twenty-six fluidounces and a half, or as much as may be sufficient.

Boil the Bitartrate of Potash with two gallons of the distilled water, and add gradually half of the prepared Chalk; afterwards, the effervescence having ceased, add the remainder of the Chalk first dissolved in the Hydrochloric Acid with four pints of the distilled water. Lastly, set by [the mixture] that the Tartrate of Lime may subside; pour off the liquor, and wash the Tartrate of Lime frequently with distilled water, till it is free from taste. Then pour on it the diluted Sulphuric Acid, and boil them for a quarter of an hour. Evaporate the strained liquor with a gentle heat, that crystals may be formed.

Dissolve the crystals, that they may be pure, again and a third time in water, and strain [the solution] as often, boil down, and set it aside.

Remarks.—Bitartrate of Potash, sometimes called Supertartrate of Potash, Tartar or Cream of Tartar, is a well-known acidulous salt deposited from wine; it occurs in the state of small colourless hard crystals, which are very sparingly soluble in water. In its original impure state it is called *argol*, and is of a yellowish or red colour, according to that of the wine which yields it. It contains tartrate of lime, colouring matter and other impurities, from which it is partly freed by solution in boiling water, and crystallization as the solution cools.

Properties.—Bitartrate of Potash is colourless, inodorous, and

has a sour taste; when dissolved in water the solution reddens litmus paper; it requires 60 parts of cold and 15 of boiling water to dissolve one part of it; if the solution be exposed to the air, the tartaric acid is decomposed, and carbonate of potash is formed. When subjected to distillation it yields carbonic acid, some pyrotartaric acid, carburetted hydrogen, carbonic oxide, water, and empyreumatic oil. If calcined in an open fire it leaves carbonate of potash, mixed with a little lime derived from the tartrate of lime, of which it contains generally about 5 per cent.

The primary form of the crystal of bitartrate of potash is a *right rhombic prism*: the first of the annexed figures represents the planes of its ordinary crystal in a perfect state; M and M′ are the lateral primary planes, and the crystals admit of cleavage parallel to those planes, and to the plane *h*, which is parallel to the shorter diagonal of the primary prism; it also cleaves parallel to the longer diagonal. The crystals are not, however, commonly so perfect as this figure, nor indeed is it usual to observe all its planes; for owing to the extraordinary enlargement of certain of them, others are either much diminished, or totally disappear. The common crystals are represented by the second figure; and in observing them, it must be recollected that the plane *h* is constantly striated, as represented in both figures.

Fig. 1.

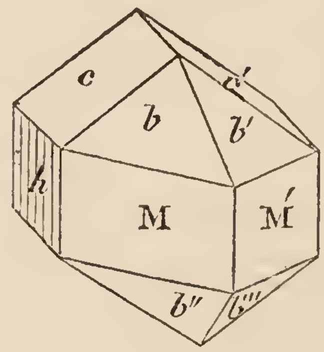
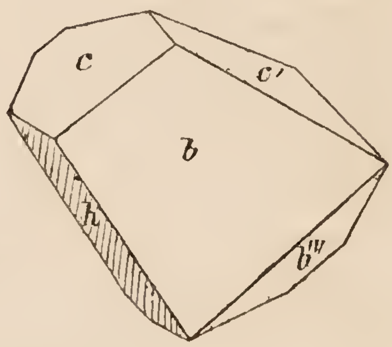


Fig. 2.



M on M′	107°	30′
—— *h*	126	15
—— *b*	117	2
b on *b*‴	74	0
b on *c*	141	25
b on *c*′	103	18
c on *h*	125	30
c on *c*′	109	0

It is composed of

Two equivalents of Tartaric Acid.. $66 \times 2 =$	132	or 70
One equivalent of Potash	48	,, 25·3
One equivalent of Water	9	,, 4·7
Equivalent....	189.	100·

Symbol,—Berzelius and Turner .. KO, $2H^2 C^4 O^5$, HO.

Brande .... $(2tar' + P + q)$.

Process.—The Tartaric Acid of the bitartrate of potash is by two distinct operations converted into tartrate of lime. When half of the chalk or carbonate of lime is added, as directed, to the whole of the bitartrate of potash, one half of the acid which it contains, acts as a free acid, carbonic acid is expelled, and tartrate of lime formed, which being a salt of little solubility is precipitated; there remains in solution neutral tartrate of potash, as shown by the annexed diagram:

Bitartrate of Potash.	Tartrate of Potash.	Carbonic Acid *Gas.*	Chalk or Carbonate of Lime.
	Tartaric Acid.	Lime.	

Tartrate of Lime.

When the remaining half of the chalk or carbonate of lime is dissolved in hydrochloric acid, we obtain, as shown under the head of CALCII CHLORIDUM, a solution of chloride of calcium; and when this is added to the now *neutral* tartrate of potash, left as described in the first operation, the changes that occur by double elective affinity and decomposition, are, that the chlorine quits the calcium to combine with the potassium of the potash, chloride of potassium is formed and remains in solution; the oxygen separated from the potassium unites with the calcium left by the chlorine, lime is the result, and this combines with the tartaric acid separated from the potash, and tartrate of lime is formed, which, as already explained, is precipitated on account of its insolubility, thus:

Chloride of Potassium.

Chloride of Calcium.	Chlorine.	Potassium. Oxygen. (Potash.)	Tartrate of Potash.
	Calcium. *Oxygen.*		
	Lime.	Tartaric Acid.	

Tartrate of Lime.

When the tartrate of lime thus formed is mixed with the diluted sulphuric acid, it is decomposed owing to the superior

affinity of the sulphuric acid for lime, and the sulphate of lime precipitating on account of its insolubility in water, the tartaric acid remains in solution:

Solution of Tartaric Acid.

Tartrate of Lime.	Tartaric Acid.	Water.	Diluted Sulphuric Acid.
	Lime.	Sulphuric Acid.	

Sulphate of Lime.

The solution of tartaric acid by evaporation yields crystals, which are purified from their colouring matter by repeatedly dissolving and crystallizing as directed.

Properties.—Tartaric Acid is colourless, inodorous, and very sour to the taste; it occurs in crystals of considerable size, the primary form of which is *an oblique rhombic prism.*

Fig. 1. exhibits the crystal as usually modified, with the planes symmetrically placed. Fig. 2. exhibits the same modified form, with the planes irregularly disposed, as they appear in most of the crystals, the corresponding planes in both being marked with the same letters. This affords another instance of irregularity, which renders it not easy immediately to perceive the relations of the several planes to each other.

Fig. 1.

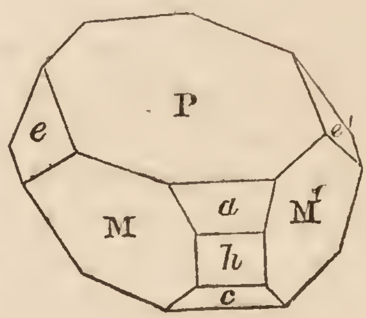
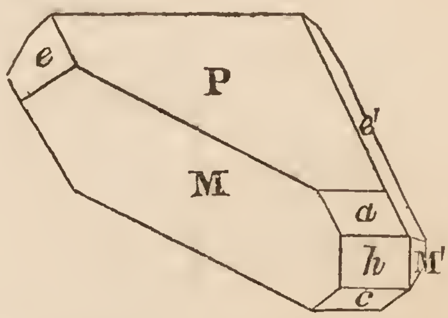


Fig. 2.



P on M, or M'	97°	10'
M on M'..................	88	30
P on *e* or *e'*	128	15
P on *a*	134	50
P on *h*	100	47

Tartaric Acid suffers no change by exposure to the air; water at 60° dissolves about one-fifth, and at 212° twice its weight; the solution acts strongly upon vegetable blue colours; it decomposes and becomes mouldy by keeping. It is soluble in alcohol, but more sparingly so than in water. When the crystals are heated to a little above 212°, they melt into a fluid which boils at 250°, leaving a semitransparent and rather deliquescent

mass on cooling. If more strongly heated in a retort, this acid is decomposed, and yields among other products a peculiar acid, called pyrotartaric acid; when heated in the air, a coaly mass is procured, but which is eventually dissipated.

When treated with sulphuric acid it is decomposed, and acetic acid is obtained; by nitric acid it also suffers decomposition, and a portion of its carbon combines with sufficient oxygen to convert it into oxalic acid. Tartaric acid has a remarkable tendency to form double salts (Sodæ Potassio-tartras).

Tartaric Acid when in solution readily acts upon those metals which decompose water, such as iron and zinc; like the bisalt from which it is obtained, it combines with most metallic oxides, with the alkalis, and most earths to form salts, which are called tartrates.

Composition.—Tartaric Acid free from water, in which condition, however, it cannot be obtained by mere exposure to heat, is composed of

Two equivalents of Hydrogen	$1 \times 2 = 2$	or	3·
Four equivalents of Carbon	$6 \times 4 = 24$	„	36·4
Five equivalents of Oxygen	$8 \times 5 = 40$	„	60·6
Equivalent.........	66.		100·

In the state of crystals the acid consists of

1 equivalent of Anhydrous Acid	66	or	88
1 equivalent of Water.....................	9	„	12
	75.		100·

Symbol,—Berzelius and Turner... $H^2\ C^4\ O^5$.

Do. (Crystals) ... $H^2\ C^4\ O^5$, HO.

Brande .... *tar'*.

Do. (Crystals) ... $(tar' + q)$.

Incompatibles.—Tartaric Acid, as already noticed, combines with the alkalis and decomposes their carbonates; its effects are similar upon most earths and oxides and their carbonates, and it is therefore incompatible with them. It decomposes the salts of potash when in solution, converting part of the potash into bitartrate, which is quickly precipitated in minute crystals; the solution also gives immediate precipitates with lime-water, the salts of lime and of lead; and when tartrate of soda is heated with a solution of chloride of platina, metallic platina is precipitated in the state of a black powder.

Impurities and Tests.—See Notes: Acidum Tartaricum.

Medicinal Uses.—This acid being cheaper than citric acid, it is sometimes employed instead of it, especially in preparing what are called sodaic powders, used as substitutes for soda water. It is largely used in calico-printing. Bitartrate of potash is employed in the Pharmacopœia in preparing Antimonii Potassio-tartras, Ferri Potassio-tartras, Potassæ Tartras, Sodæ Potassio-tartras.

ÆTHEREA.

PREPARATIONS OF ÆTHER.

ÆTHER SULPHURICUS.

Sulphuric Æther.

Spiritus Vitrioli Dulcis, P.L. 1746.
Æther Vitriolicus, P.L. 1788.
Æther Rectificatus, P.L. 1809, P.L. 1824.

Take of Rectified Spirit three pounds,
Sulphuric Acid two pounds,
Carbonate of Potash, previously ignited, an ounce;

Pour two pounds of the spirit into a glass retort, add the acid to it, and mix. Afterwards place it on sand, and raise the heat so that the liquor may quickly boil, and the Æther pass into a receiving vessel cooled with ice or water. Let the liquor distil until some heavier portion begins to pass over. To the liquor which remains in the retort, after the heat has diminished, pour the remainder of the spirit, that æther may distil in like manner.

Mix the distilled liquors, then pour off the supernatant portion, and add to it the Carbonate of Potash, shaking them frequently during an hour. Lastly, let the æther distil from a large retort, and be kept in a stopped vessel.

Properties.—Sulphuric Æther is a colourless, limpid, transparent fluid, of a pleasant smell and a pungent taste; it is extremely volatile, and its vapour when respired mixed with air produces very exhilarating effects. When recently prepared, æther is not at all acid, but after long keeping it reddens litmus paper, owing to the formation of acetic acid by absorbing oxygen from the air. According to Mitscherlich its specific gravity is 0·724 at 55° Fahrenheit; when its density exceeds this, it contains either alcohol or water, or both. At 30° below zero it begins to assume a foliated appearance, and at 17° lower it becomes a white, solid, crystalline mass.

Owing to the extreme volatility of æther a considerable quantity evaporates, even while being poured from one vessel to another, and during evaporation it produces much cold, as may be felt by pouring it on the hand; if a small thin glass tube enveloped in cloth, and containing water, be dipped a few times in æther, allowing it to evaporate after each immersion, the water may be frozen; in a cold atmosphere even mercury may be solidified by its cooling power.

The specific gravity of the vapour of æther is 2·586, that of air being 1·; so that although it is a very light liquid it yields a dense vapour. Under a mean atmospheric pressure æther boils at about 96° of Fahrenheit, and *in vacuo*, even at 40° below zero; therefore if it were not for the pressure of the air, it would always exist in the aëriform state.

Æther and the vapour which arises from it are very inflammable, and during its combustion, under common circumstances, water is formed by the union of its hydrogen with the oxygen of the air, and carbonic acid by the combination of its carbon with the same element. When, however, a coil of platina wire is heated to redness, and then suspended above the surface of æther contained in an open vessel, the wire instantly begins to glow, and continues in that state until the æther is consumed; during this combustion an acid is formed distinct from the carbonic, and it was at first imagined by Professor Daniell to be a peculiar acid; it has however been lately supposed to contain formic acid. When the vapour of æther is passed through a red hot porcelain tube, it is decomposed, and the products are charcoal, water, carbonic oxide and carburetted hydrogen.

But little water is dissolved by æther, and water takes up only one-ninth of its volume of æther. When æther contains alcohol it may be separated by shaking with water, which dissolves the alcohol, and the water dissolved by the æther may be separated by agitation with lime and subsequent distillation. In the formula carbonate of potash is used for the last-mentioned purpose, and to combine with any sulphurous acid.

Æther dissolves the resins, and even caoutchouc, which is not

acted on by alcohol; it takes up a little sulphur and phosphorus; the solution of this last substance becomes luminous in the dark when poured on the hand or hot water. The alkalis, potash and soda are not soluble in æther, which constitutes another marked difference between it and alcohol.

Process.—The nature of the reaction by which æther is produced is a subject which has been much discussed, and some difference of opinion still exists respecting it.

Spirit of Wine, or rather the Alcohol which it contains, and to which its properties are owing, is composed of

Three equivalents of Hydrogen.	$1 \times 3 =$	3
Two equivalents of Carbon	$6 \times 2 =$	12
One equivalent of Oxygen		8
Equivalent ..		23

Æther consists of

Five equivalents of Hydrogen ..	$1 \times 5 =$	5
Four equivalents of Carbon....	$6 \times 4 =$	24
One equivalent of Oxygen		8
Equivalent ..		37

As the equivalent of æther contains twice as much carbon as that of alcohol, it is evident that at least two equivalents of alcohol are required to produce one equivalent of æther, and it is equally apparent that the difference between them depends upon the different proportions of the other elements; thus:

Parts by Weight.

	Carbon.		Oxygen.		Hydrogen.		
Two eqs. of Alcohol	= 24	+	16	+	6	=	46
One eq. of Æther ..	= 24	+	8	+	5	=	37
Difference ..			8	+	1	=	9, one eq. of water.

When then either an equivalent of water, or of each of the elements which constitute it, is separated from two equivalents of alcohol, the result is one equivalent of æther: and it was supposed by Fourcroy and Vauquelin that the sulphuric acid in its action upon alcohol produced this effect in a direct mode, on account of its well-known great affinity for water; this however does not appear to be the case.

According to Mr. Hennell the action of the sulphuric acid is intermediate; he found that when two equivalents of sulphuric acid, and two of alcohol were merely mixed, the acid immediately lost four-sevenths of its power of precipitating oxide of lead, and

undergoing great change of properties, was converted into a peculiar acid called the sulphovinic acid, consisting of

Two equivalents of Sulphuric Acid..	$40 \times 2 =$	80
Two equivalents of Alcohol........	$23 \times 2 =$	46
	Equivalent..	126

or, what is the same, of

Two equivalents of Sulphuric Acid..	$40 \times 2 =$	80
Six equivalents of Hydrogen	$1 \times 6 =$	6
Four equivalents of Carbon........	$6 \times 4 =$	24
Two equivalents of Oxygen........	$8 \times 2 =$	16
	Equivalent..	126

When an equivalent of this acid is heated it is decomposed; the two equivalents of sulphuric acid, and one equivalent of water, remain in the retort, while the other elements combine to form an equivalent of æther, which is distilled; thus:

	Sulphuric Acid.	Oxygen.	Hydrogen.	Carbon.	
1 eq. Sulphovinic Acid	=80 +	16	+6	+24	= 126
Remain in the retort	80 +	8	+1		= 89
Distilled..		8	+5	+24	= 37, æther.

In the mode in which its constitution is here stated, æther is a mere ternary compound of its elements; it has however with great plausibility been supposed, that two of these elements exist as a binary compound, and that this is united with the other element to form æther. Thus it may be shown that the elements of æther are equivalent to, and have been supposed to exist as a dihydrate of olefiant gas; as a hydrate of etherin, that is of a peculiar carburetted hydrogen to which the name of etherin has been given; lastly, it has been proposed by Dr. Kane (Dublin Journal of Medical Science, &c., January 1833,) to consider æther as a protoxide of *ethereum,* which name he gives to a compound consisting of the 4 eqs. carbon and 5 eqs. of hydrogen which are actually contained in the æther. A similar view was soon afterwards promulgated by Berzelius, who gave the theoretic carburetted hydrogen the name of *ethule.*

Preferring this to the other theoretical opinions, I shall exhibit the composition of ethereum, æther, alcohol and sulphovinic acid in accordance with it, referring to Turner's Chemistry, and Brande's Manual for further information, and for an explanation of the other opinions alluded to.

Ethereum or Ethule.		Æther.	
Four equivalents Carbon . .	24	One equivalent Ethereum . .	29
Five equivalents Hydrogen	5	One equivalent Oxygen . .	8
Equivalent	29	Equivalent	37

Alcohol.		Sulphovinic Acid.	
One equivalent Ethereum . .	29	One equivalent Ethereum . .	29
One equivalent Oxygen . .	8	One equivalent Oxygen . .	8
One equivalent Water	9	One equivalent Water	9
		Two eqs. Sulphuric Acid . .	80
2 Equivalents . .	46		
		Equivalent	126

It is to be observed that the two equivalents of sulphuric acid which remain in the retort after distillation, are combined not only with the one equivalent of water resulting from the decomposition of the alcohol, but also with that portion of it which exists in the liquid sulphuric acid employed. Usually also a quantity of carbon is deposited from the decomposition of a portion of the alcohol; but this is an accidental and not a necessary product in the formation of æther.

Owing to the additional water which the sulphuric acid acquires in the common way of operating, its power of action is much diminished, and therefore only half the quantity of spirit is used in the second operation. Mitscherlich has however shown, that by peculiar management the sulphuric acid may be employed for an unlimited number of times, and without diminution of power. (*Elémens de Chimie*, i. p. 100.)

On the above-described view of the subject, ethereum is a 4–5 carburet of hydrogen; æther an oxide of ethereum; alcohol a hydrated oxide of ethereum, or a hydrate of æther; and sulphovinic acid a hydrated bisulphate of oxide of ethereum, or a hydrated bisulphate of æther. The symbols of Berzelius and Turner and Brande intended to explain some of these views are annexed.

Ethereum or Ethule.	Æther.	Alcohol.	Sulphovinic Acid.
$C^4H^5 = El.$	ElO.	ElO, HO.	ElO, $2SO^3$, HO.
$(4car+5h.)$	$(4car+5h+o.)$	$(4car+5h+o+q.)$	$(2S'+4car+5h+o+q.)=sulv'.$

Pharmacopœia Preparation.—Spiritus Ætheris Sulphurici Compositus.

Tests and Impurities.—See Notes: Æther Sulphuricus.

Medicinal Uses.—Stimulant, antispasmodic. Dose, fʒss to fʒij. On account of the cold which it produces during evaporation, it is a useful refrigerant applied to scalds and burns.

OLEUM ÆTHEREUM.

Æthereal Oil.

Oleum Vini, P.L. 1788.
Oleum Æthereum, P.L. 1809, P.L. 1824.

Take of Rectified Spirit two pounds,
Sulphuric Acid four pounds,
Solution of Potash,
Distilled Water, each a fluidounce, or as much as may be sufficient ;

Mix the Acid cautiously with the Spirit. Let the liquor distil until a black froth arises ; then immediately remove the retort from the fire. Separate the lighter supernatant liquor from the heavier one, and expose the former to the air for a day. Add to it the Solution of Potash first mixed with the water, and shake them together. Lastly, when sufficiently washed, separate the Æthereal Oil which subsides.

Process.—The proportion of sulphuric acid directed to be used, does not differ materially from that employed by Hennell or Serullas. The products of the distillation are æther, water, sulphurous acid, and a yellow oily fluid which floats upon the water. The formation of the æther and water has been already explained ; the sulphurous acid results from the mutual decomposition of a portion of the sulphuric acid and alcohol, the black froth being charcoal separated from the spirit. The yellow oily fluid on exposure to the air loses, by evaporation, the æther with which it is mixed, and the residue after the action of the potash to separate the sulphurous acid, is æthereal oil, sometimes called heavy oil of wine to distinguish it from a lighter oil, which it yields by partial decomposition.

Properties.—Æthereal Oil is a yellow fluid, somewhat resembling oil of lavender in appearance ; it has a penetrating aromatic odour ; its taste is rather sharp and bitter ; in water it is insoluble, but dissolved by æther and by alcohol. Its specific gravity according to Hennell is 1·05 ; while Dumas states it to be 1·133, and he also observes that its composition is rather variable ; this

from Hennell's statement appears to depend upon the different quantities of a peculiar carburet of hydrogen which it is apt to contain, and which by long keeping separates in prismatic crystals. Chloride of barium when added to this oil gives no precipitate, but when they are heated together to dryness, the oil is decomposed and sulphate of barytes is precipitated; the necessity of heat to produce this effect proves, that the sulphuric acid is intimately combined with the other constituents of the oil.

When oil of wine is gently heated with water, or a solution of potash, it is resolved into sulphovinic acid and the peculiar carburetted hydrogen which with the sulphovinic acid forms oil of wine. If the residual sulphovinate of potash be strongly heated, the sulphovinic acid is decomposed, and sulphate of potash remains.

Composition.—The analysis of Hennell gives as the composition of æthereal oil,

Sulphuric Acid..	38·	or nearly one equivalent..	40
Carbon........	53·7	nine equivalents	54
Hydrogen......	8·3	nine equivalents	9
	100·		103

According to Serullas, whose analysis differs but little from that of Liebig, it contains

Sulphuric Acid	55·00
Hydrogen	6·18
Carbon.......................	33·00
Oxygen	5·42
	99·60

If this analysis be correct, or even nearly so, the oil examined by Hennell must have contained excess of the peculiar carburetted hydrogen in solution, which, as has been noticed, he found, on long keeping, to be capable of crystallizing from it.

Serullas terms æthereal oil a *sulphate of æther*, and Dumas *sulphatic æther*, observing that if the name of sulphuric æther had not been already in use, it would be the proper appellation of æthereal oil. On this view of the subject the oil must be composed of

One equivalent of Sulphuric Acid........			40		or 52·00
Four eqs.	one eq. of æther or oxide of ethereum.	Carbon	24	=37	31·16
Five eqs.		Hydrogen	5		6·49
One eq.		Oxygen	8		10·35
Equivalent of Oleum Æthereum			77·		100·

Except in the quantity of oxygen, this statement agrees nearly with the analysis of Serullas; and if it be correct, it appears that when æther is formed in the presence of a great excess of sulphuric acid, one equivalent of each combines to form æthereal oil or sulphate of æther; the symbol of which will be

Berzelius and Turner ..	ElO, SO^3.
Brande..............	$(eth + s')$.

Pharmacopœia Preparation.—Spiritus Ætheris Sulphurici Compositus.

SPIRITUS ÆTHERIS NITRICI.

Spirit of Nitric Æther.

Spiritus Nitri Dulcis, P.L. 1746.
Spiritus Ætheris Nitrosi, P.L. 1788.
Spiritus Ætheris Nitrici, P.L. 1809, P.L. 1824.

Take of Rectified Spirit three pounds,
Nitric acid four ounces;

Add the Acid gradually to the Spirit, and mix; then let thirty-two fluidounces distil.

Process.—It has been observed that when sulphuric acid acts upon alcohol, æther is produced without decomposing the acid; when, however, nitric acid is employed, both it and the alcohol suffer decomposition. It has been mentioned that nitric acid is composed of oxygen and azote; during its action upon alcohol it loses a portion of oxygen, and the pure æther formed when separated, in a mode presently to be described, from the water and undecomposed spirit with which it distils, is composed of, according to Dumas and Boullay,

One equivalent of Æther........	37	or 49·33
Three equivalents of Oxygen	24	„ 32·00
One equivalent of Azote........	14	„ 18·67
Equivalent......	75.	100·

As an equivalent of nitric acid contains 5 equivalents of oxy-

gen 40, and 1 equivalent of azote 14, it is evident that 1 equivalent by converting alcohol into æther loses 2 equivalents of oxygen 16, and by this it is reduced to hyponitrous acid, which combines with the equivalent of æther formed, constituting hyponitrous æther or hyponitrite of æther, composed of

One equivalent of Hyponitrous Acid	38	or 50·66
One equivalent of Æther	37	„ 49·34
Equivalent	75.	100·

The oxygen lost by the nitric acid produces various compounds with the elements of those portions of alcohol, which are decomposed, but not converted into æther.

Dr. Golding Bird (*Lond. and Edinb. Phil. Mag.* vol. xiv. p. 324) has particularly examined the circumstances under which the more important substances formed during the preparation of Spiritus Ætheris Nitrici are produced; he finds that while the æther distils mixed with alcohol only, oxalhydric acid, but no oxalic acid is formed. When the æther is prepared by the action of nitric acid upon alcohol in the cold, as in Dr. Black's process, acetic acid is copiously produced, instead of, or in addition to, oxalhydric acid.

Dr. Bird has also observed, that aldehyd is generated, but does not appear in the distilled liquid, until the formation of the æther has nearly or entirely ceased: the aldehyd and oxalic acid are nearly of simultaneous origin, and result from the secondary action of nitric acid upon substances formed in the early stages of the operation; the "crystals of Hierne," deposited when the distillation is continued until red fumes appear, are oxalic acid; while the substance mentioned by Thenard as very easily carbonized, is probably aldehyd.

It is to the presence of aldehyd, in the opinion of Dr. Bird, that Spiritus Ætheris Nitrici is indebted for the pungent acrid flavour it so frequently possesses, but from which it is quite free when the process of the Pharmacopœia is adopted.

Properties.—The Spiritus Ætheris Nitrici of the Pharmacopœia is a mixture of alcohol and hyponitrous æther; it is colourless, has a peculiar and rather fragrant æthereal odour; is very volatile, producing much cold during evaporation, and it is extremely inflammable. It mixes with water and alcohol in all proportions. Its specific gravity should not exceed 0·834; but when the distillation is continued too long, the product is specifically heavier, high-coloured, has a pungent odour, is very acid, so as to act strongly on litmus paper, and decomposes the alkaline carbonates with effervescence. By keeping, it also becomes more acid than when recently prepared.

Hyponitrous Æther may be separated from the alcohol, water

and uncombined acid, which the preparation of the Pharmacopœia contains, by digesting lime reduced to powder in it, and subjecting the mixture to distillation. The pure hyponitrous æther thus procured is of a pale yellow colour; its smell is æthereal, and when diffused, not unlike that of ripe apples; its specific gravity at about 40° is 0·886. It is extremely volatile, and it boils at about 70° F. under the usual pressure; it undergoes ebullition even when held in the hand, by evaporation produces a great degree of cold, and yields a very inflammable vapour, which burns with a bright flame. It does not act upon litmus paper until it has suffered partial decomposition, which takes place spontaneously, especially when in contact with water, by which one part is dissolved and another decomposed; when mixed with a solution of potash it yields hyponitrite and a little acetate of potash and alcohol. The density of its vapour is 2·627. When passed through a porcelain tube heated to redness, hyponitrous æther yields azotic gas, nitric oxide gas, and cyanide of ammonia.

Symbols,—Berzelius and Turner .. ElO, NO^3.
Brande .... $(\text{Eth} + \acute{n}\grave{})$.

Impurities and Tests.—See Notes: Spiritus Ætheris nitrici.

Medicinal Uses.—Refrigerant: Diuretic. Dose, ♏x to ♏xl.

SPIRITUS ÆTHERIS SULPHURICI COMPOSITUS.

Compound Spirit of Sulphuric Æther.

Spiritus Ætheris Vitriolici Compositus, P.L. 1788.
Spiritus Ætheris Compositus, P.L. 1809.
Spiritus Ætheris Sulphurici Compositus, P.L. 1809, edit. alt., P.L. 1824.

Take of Sulphuric Æther eight fluidounces,
Rectified Spirit sixteen fluidounces,
Æthereal Oil three fluidrachms;
Mix.

Remarks.—This preparation is analogous to the *Liquor anodynus mineralis* of Hoffman. By the admixture of spirit with the æther and æthereal oil, these are rendered miscible with water, and more convenient for exhibition.

Medicinal Uses.—Stimulant, Antispasmodic. Dose f℥ss. to f℥ij.

ALKALINA.

ALKALIS.

ACONITINA.

Aconitina.

Take of the Root of Aconite, dried and bruised, two pounds,
Rectified Spirit three gallons,
Diluted Sulphuric Acid,
Solution of Ammonia,
Purified Animal Charcoal, each as much as may be sufficient;

Boil the Aconite with a gallon of the Spirit for an hour in a retort to which a receiver is adapted. Pour off the liquor, and again boil the residue with another gallon of the Spirit, and with the Spirit recently distilled, and pour off the liquor also. Let the same be done a third time. Then press the Aconite, and all the liquors being mixed and strained, let the Spirit distil. Evaporate what remains to the proper consistence of an extract. Dissolve this in water and strain. Evaporate the liquor with a gentle heat, that it may thicken like a syrup. To this add of dilute Sulphuric Acid, mixed with distilled water, as much as may be sufficient to dissolve the Aconitina. Then pour in Solution of Ammonia, and dissolve the Aconitina precipitated, in dilute Sulphuric Acid and water, mixed as before. Afterwards mix in the Animal Charcoal, frequently shaking them during a quarter of an hour. Lastly, strain, and Solution of Ammonia being again poured in that the Aconitina may be precipitated, wash and dry it.

Remarks.—Aconitina is one of a numerous class of bodies called vegetable alkalis or alkaloids. It appears to have been

first stated by Pallas in 1825, that aconite contains a peculiar alkali; and it has since been more particularly examined by Hesse. Like the other substances of this class, it exists in the aconite in combination with a vegetable acid, to which the name of *aconitic acid* has lately been given; the vegetable salt or aconitate of aconitina is dissolved by the spirit, in which the root containing it is boiled, with some portion of its colouring matter.

Properties.—This alkali crystallizes from a spirituous solution in granular crystals, but it is stated that these are not quite pure; indeed, the greater part is incapable of crystallizing; when obtained by evaporation it is a transparent colourless mass, with a glassy lustre: it has no smell; the taste is at first bitter, and afterwards acrid, but this is not permanent, and appears to be derived from another principle (anemonin), from which it may be separated, by repeated solution in and precipitation from acids.

Aconitina is soluble in 150 times its weight of cold, and 50 of boiling water. Alcohol and æther dissolve it in large quantity, and the solutions are decidedly alkaline; it does not change by exposure to the air; when heated moderately it fuses, and when strongly heated it is decomposed, yielding carbonate of ammonia in the same manner as the other vegetable alkalis, like which it is composed of hydrogen, carbon, oxygen, and azote, but in proportions that have not yet been determined.

Although aconitina combines with acids to form salts, they do not, as far as they have been examined, crystallize, but dry into a gummy mass; their taste is very bitter; the solution of nitrate of aconitina is colourless, that of the sulphate is yellow at first and afterwards becomes of a dark violet; the alkalis decompose them, precipitating the aconitina.

This alkali is in the highest degree poisonous; the 50th part of a grain dissolved in spirit of wine killed a sparrow in a few minutes, and the 20th of a grain instantly; applied to the eye it occasions almost insupportable heat and tingling and contraction of the pupil.

Impurities and Tests.—See Notes: ACONITINA.

Medicinal Uses.—It is too powerful a medicine to be exhibited internally, but has been applied with success in the form of an ointment, in the proportion of one grain to a drachm of lard, in neuralgic affections. Very similar medicinal powers appear to reside in *Delphia,* an alkali obtained much more readily from the *Delphinium Staphisagria.*

LIQUOR AMMONIÆ.

Solution of Ammonia.

Aqua Ammoniæ Puræ, P.L. 1788.
Liquor Ammoniæ, P.L. 1809, P.L. 1824.

Take of Hydrochlorate of Ammonia ten ounces,
Lime eight ounces,
Water two pints;

Put the Lime slacked with water into a retort, then add the Hydrochlorate of Ammonia broken into small pieces, and the rest of the water. Let fifteen fluid-ounces of solution of Ammonia distil.

Process.—Hydrochlorate of Ammonia, frequently called muriate of ammonia and sal ammoniac, is a compound of hydrochloric acid and ammonia, or the volatile alkali *. When mixed with lime and water and subjected to distillation, the changes which occur are these: hydrochloric acid is composed of hydrogen and chlorine, and the lime of oxygen and the metal calcium, or it is an oxide of the metal; when the hydrochlorate of ammonia and lime act upon each other, not only is the hydrochlorate decomposed, so as to yield its ammonia in the gaseous state, but the hydrochloric acid and lime, or oxide of calcium, also undergo decomposition; the chlorine of the acid and the calcium of the oxide combine to form chloride of calcium, which remains in the retort, while the hydrogen of the acid and the oxygen of the oxide form water, and the ammonia set at liberty is expelled, and being volatilized with the water, is condensed with it in the receiver.

Liquor Ammoniæ, P.L.
Solution of Ammonia.

	Ammonia (*gas*).	*Water.*	
Hydrochlorate of Ammonia.		*Hydrogen.* *Oxygen.*	Lime *or* Oxide of Calcium.
	Hydrochloric Acid.	*Chlorine.* *Calcium.*	
		Chloride of Calcium.	

* For an explanation of some hypothetical opinions as to the nature of Ammoniacal Salts, see Appendix.

Ammoniacal gas is transparent, colourless, and of course invisible. Its smell is extremely pungent, and its taste acrid. Its sp. gr. compared with atmospheric air is as 0·5893 to 1·, and 100 cubic inches weigh nearly 18·27 grains. An animal immersed in it is quickly killed; it extinguishes the flame of a taper, but it is enlarged before extinction. It is very rapidly condensed by water; the solution is colourless and transparent, and like the gas possesses properties which are most strongly alkaline, turning vegetable yellow colours brown and blues green; it combines readily with acids and destroys their power of reddening vegetable blue colours. When subjected to a pressure of about 6·5 atmospheres at the temperature of 50°, ammoniacal gas was found by Faraday to become a colourless transparent liquid, having a sp. gr. of 0·760. When ammoniacal gas is mixed with oxygen gas, and fired by the taper, water is formed, and azotic gas left; and by being passed through a red-hot tube, it is resolved into hydrogen gas and azotic gas in the proportions stated below; and the same effect is produced by electricity. The aqueous solution decomposes by exposure to the air, and still more readily by heat, the ammonia being dissipated in the elastic or gaseous form.

Composition.—Ammoniacal gas is composed of 3 volumes of hydrogen gas and 1 volume of azotic gas, condensed by combination into 2 volumes; or which is the same, it consists of

150	cubic inches of	Hydrogen gas,	weighing	3·225 grains.
50	„ „	Azotic gas,	„	15·050 „
Total 200	cubic inches,	condensed to 100,	weighing	18·275 grains.

By weight it is constituted of

Three equivalents of Hydrogen $1 \times 3 =$	3	or 17·64
One equivalent of Azote	14	„ 82·36
Equivalent....	17.	100·

Symbol,—Berzelius and Turner .... NH^3.
Brande.................... A.

One hundred grains of a solution of sp. gr. 0·960, as directed in the Pharmacopœia, is composed very nearly of

Ammoniacal gas......	10 grains.
Water	90 „
	100

A cubic inch of Liquor Ammoniæ weighs 242·36 grains, and it contains 132 cubic inches of ammoniacal gas in condensed solution; a cubic inch of Liquor Ammoniæ Fortior weighs 222·66 grains, and it holds dissolved nearly 400 cubic inches of ammoniacal gas.

Incompatibles.—Liquor Ammoniæ is incompatible with acids, acidulous and most earthy and metallic salts, but it does not decompose the salts of lime, barytes or strontia, those of magnesia only partially, and the potassio-tartrate of iron is not at all precipitated by it.

Impurities and Tests.—See Notes: AMMONIÆ LIQUOR.

Pharmacopœia Preparations.—Hydrargyri Ammonio-chloridum, Linimentum Ammoniæ, Linimentum Camphoræ Compositum, Linimentum Hydrargyri Compositum.

Pharmacopœia Uses.—Aconitina, Morphia, Morphiæ Hydrochloras, Quinæ Disulphas, Strychnia, Veratria.

Liquor Ammoniæ Fortior is employed only in the Tinctura Ammoniæ Composita.

Medicinal Uses.—Liquor Ammoniæ is stimulant, rubefacient and antacid; it may be exhibited in milk, water, or any cold liquid which is not incompatible with it. Dose ♏x to ♏xxx. If it should be swallowed by mistake, the best antidote is vinegar or lemon-juice.

AMMONIÆ SESQUICARBONAS.

Sesquicarbonate of Ammonia.

Sal Volatilis Salis Ammoniaci, P.L. 1746.
Ammonia Præparata, P.L. 1788.
Ammoniæ Carbonas, P.L. 1809.
Ammoniæ Subcarbonas, P.L. 1809, edit. alt., P.L. 1824.

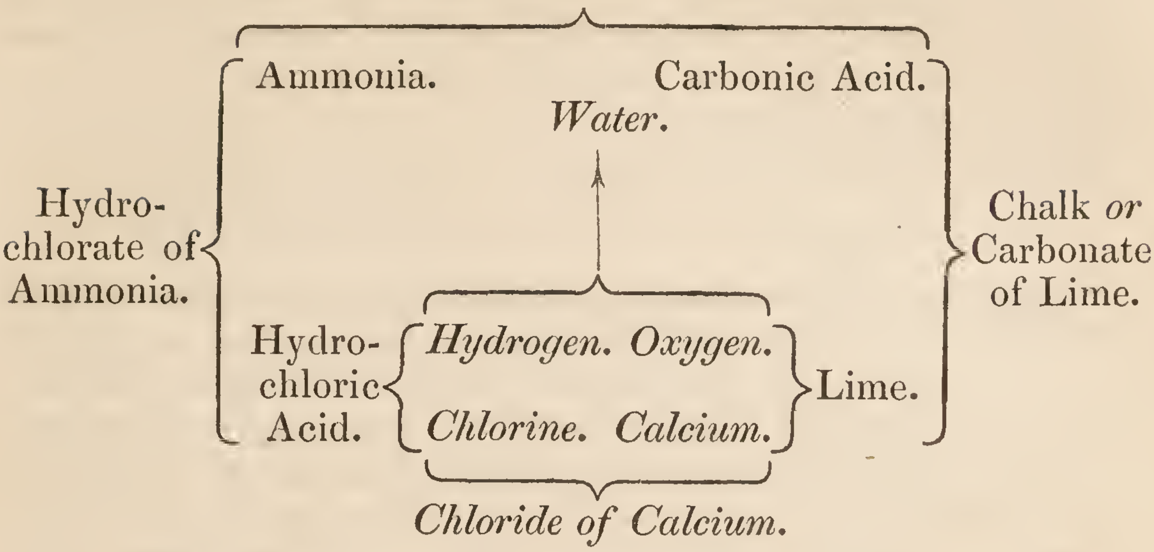
Take of Hydrochlorate of Ammonia a pound,
Chalk a pound and a half;

Rub them separately to powder; then mix, and with heat, gradually increased, sublime.

Process.—The reaction in this case is more complicated than that of the last; instead of lime, carbonate of lime is employed, and the product is consequently a carbonate of ammonia.

Ammoniæ Sesquicarbonas, P.L.

Hydrated Sesquicarbonate of Ammonia.



Composition.—This salt consists, in its perfect state, of

Three eqs. of Carbonic Acid	$22 \times 3 = 66$	or Carbonic Acid	55·93
Two eqs. of Ammonia	$17 \times 2 = 34$	„ Ammonia....	28·81
Two eqs. of Water	$9 \times 2 = 18$	„ Water	15·26
Equivalent	118.		100·

Instead, however, of regarding it as composed of 3 equivalents of acid and 2 equivalents of base, it is more convenient to consider it as in the Pharmacopœia, as constituted of $1\frac{1}{2}$ equivalent of carbonic acid united to 1 equivalent of ammonia and 1 of water. On this view its composition is thus stated:

One and a half equivalent of Carbonic Acid	33
One equivalent of Ammonia	17
One equivalent of Water	9
Equivalent	59

It is however to be remarked that both the hydrochlorate of ammonia and carbonate of lime are neutral compounds, that is, each consists of 1 equivalent of acid and 1 of base; the production of sesquicarbonate of ammonia, which is a supersalt, instead of a neutral one, as usually happens when neutral compounds suffer mutual decomposition, is explained by supposing three equivalents of each salt to undergo decomposition, when, if no loss occurred in the operation, the carbonate of ammonia would be neutral and hydrated, consisting of

Three equivalents of Carbonic Acid	$22 \times 3 = 66$
Three equivalents of Ammonia	$17 \times 3 = 51$
Three equivalents of Water	$9 \times 3 = 27$
	144

During sublimation, however, one of the equivalents of the ammonia liberated and one of the water formed are dissipated; whilst the quantity of carbonic acid remaining undiminished, the carbonate actually sublimed consists of three equivalents of carbonic acid and only two of ammonia, which, as just shown, constitute it a sesquicarbonate.

Symbols,—Berzelius and Turner. . $NH^3, 1\frac{1}{2}CO^2, HO$.
Brande . . . . $(A+1\frac{1}{2}car+q)$.

Properties.—When recently prepared, sesquicarbonate of ammonia is a colourless translucent mass of a striated crystalline appearance, and it is moderately hard. Its smell is pungent, and its taste sharp and penetrating; turmeric paper when held over it is turned of a reddish brown colour by the carbonate of ammonia which escapes. It is soluble in about four times its weight of cold water, and by hot water it is decomposed with effervescence. When the bottle which contains this salt is frequently opened, or if a small quantity of it be kept in a large bottle, it gradually becomes opaque and friable, and its pungency is much diminished; if it be exposed to the air for some time, it is rendered quite devoid of smell, owing to the volatilization of neutral carbonate of ammonia, bicarbonate being left; and it will be observed that a compound of three equivalents of carbonic acid and two of ammonia, is equal to one equivalent of neutral carbonate, which evaporates, and one of bicarbonate of ammonia, which remains as an inodorous salt combined with water, consisting of

Two eqs. Carbonic Acid . .	$22 \times 2 = 44$	or Carbonic Acid	55·70
One equivalent of Ammonia	17	,, Ammonia	21·52
Two equivalents of Water .	$9 \times 2 = 18$	,, Water	22·78
Equivalent.	79.		100·

Incompatibles.—Sesquicarbonate of Ammonia is decomposed by acids, by potash and soda, and their carbonates; by lime, lime-water, magnesia, solution of chloride of calcium, alum, acidulous salts, as bitartrate and bisulphate of potash, and solutions of iron, except the potassio-tartrate; bichloride of mercury, the acetate and diacetate of lead, sulphate of iron and of zinc, are also incompatible with this salt. With sulphate of magnesia it affords no precipitate.

Pharmacopœia Preparation.—Cupri Ammonio-sulphas, Liquor Ammoniæ Acetatis, Liquor Ammoniæ Sesquicarbonatis.

Pharmacopœia Use.—Zinci Oxydum.

Medicinal Uses.—It is stimulant, antispasmodic, diaphoretic, powerfully antacid, and in large doses emetic. In the form of smelling salts it is useful in syncope and hysteria. It must not be kept in powdered mixtures, and although in the form of pill

its properties are longer retained, it is by no means an eligible mode of exhibiting it. Dose, gr. v. to gr. xx.: xxx. grains are emetic.

LIQUOR AMMONIÆ SESQUICARBONATIS.

Solution of Sesquicarbonate of Ammonia.

Spiritus Salis Ammoniaci, P.L. 1721, P.L. 1746.
Aqua Ammoniæ, P.L. 1788.
Liquor Ammoniæ Carbonatis, P.L. 1809.
Liquor Ammoniæ Subcarbonatis, P.L. 1809, edit. alt., P.L. 1824.

Take of Sesquicarbonate of Ammonia four ounces,
Distilled Water a pint;

Dissolve the Sesquicarbonate of Ammonia in the Water, and strain.

Remarks.—This solution ought not to be prepared in large quantities at a time; for by keeping, or rather by occasional exposure to the air, its pungency and powers suffer diminution. Dose, ♏xxx. to f℥j. in any bland liquid. This solution is of course incompatible with the substances already named as such with the sesquicarbonate of ammonia.

Pharmacopœia Preparation.—Linimentum Ammoniæ Sesquicarbonatis.

Pharmacopœia Use.—Ferri Potassio-tartras.

LIQUOR AMMONIÆ ACETATIS.

Solution of Acetate of Ammonia.

Aqua Ammoniæ Acetatæ, P.L. 1788.
Liquor Ammoniæ Acetatis, P.L. 1809, P.L. 1824.

Take of Sesquicarbonate of Ammonia four ounces and a half, or as much as may be sufficient,
Distilled Vinegar four pints;

Add the Sesquicarbonate of Ammonia to the Vinegar to saturation.

Process.—This is a case of single elective affinity and decomposition. In preparing this solution, carbonic acid gas is evolved, owing to the stronger affinity of the acetic acid for the ammonia with which it was combined, and acetate of ammonia is formed and remains in solution.

	Carbonic Acid *Gas*.	Sesquicarbonate of Ammonia.
Distilled Vinegar or Acetic Acid.	Ammonia.	

Acetate of Ammonia.
Liquor Ammoniæ Acetatis, P.L.

If the sesquicarbonate of ammonia have become opaque by exposure to the air, a larger quantity will be required, on account of its having been partly converted into bicarbonate of ammonia. The quantity mentioned, if quite free from bicarbonate, may be rather larger than required to saturate the vinegar, but if it contain much bicarbonate it may be too small. Such indeed are the variations both in the strength of the vinegar and the state of the ammoniacal salt, that no precise quantities of them can be stated; for these reasons, whatever may be the proportions assigned, they are to be considered merely as approximative.

Properties.—This solution is colourless when pure, and any colour which it may possess is derived from impurity; the solution should be repeatedly examined during preparation as to its state of saturation, before the whole of the ammoniacal salt is added, to ascertain that the quantity is not too large, and afterwards to prove that it is sufficient. It is better that the acid, rather than the alkaline salt, should appear to be in excess; for the carbonic acid which remains during some time in solution, and which seems to indicate excess of acetic acid, is eventually dissipated; it is owing to the presence of this acid that solution of acetate of ammonia, when mixed with that of diacetate of lead, often gives a white precipitate of carbonate of lead, and a fallacious appearance of the presence of sulphuric acid in the distilled vinegar used. Vinegar which has been condensed in a metallic worm, affords a dark-coloured precipitate when employed in preparing solution of acetate of ammonia.

Composition.—Acetate of Ammonia is composed of

One equivalent of Acetic Acid......	51
One equivalent of Ammonia........	17
Equivalent......	68

Supposing the Distilled Vinegar to contain 4·6 per cent. of

Acetic Acid, the Liquor Ammoniæ Acetatis prepared with it, will consist of, in 100 parts,

Acetate of Ammonia	6·1
Water	93·9
	100·

Incompatibles.—Acids; potash, soda and their carbonates; lime and lime water; the acetate and diacetate of lead also, on account of the carbonic acid which usually remains diffused through the Liquor Ammoniæ Acetatis, are incompatible with it, and they are especially so, if it contain undecomposed sesquicarbonate of ammonia; carbonate of lead being in both cases precipitated.

Tests and Impurities.—See Notes: AMMONIÆ ACETATIS LIQUOR.

Medicinal Uses.—This preparation is not unfrequently employed as a collyrium, in which case it is especially requisite that there should be no excess of sesquicarbonate of ammonia. When assisted by warmth and plentiful solution, it is an excellent diaphoretic, and in some cases it acts as a diuretic. Dose, f℥iv. to f℥vi. Externally as a lotion it is refrigerant.

MORPHIA.

Morphia.

Take of Hydrochlorate of Morphia an ounce,
Solution of Ammonia five fluidrachms,
Distilled Water a pint;

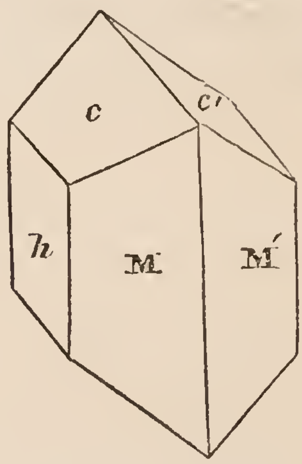
Add the Hydrochlorate of Morphia first dissolved in the pint of water to the solution of Ammonia with an ounce of water, shaking them together. What is precipitated wash with distilled water, and dry it with a gentle heat.

Remarks.—Morphia was the first discovered of the vegetable alkalis. It was obtained from opium by Sertuerner in 1803; it exists in this substance in combination with a peculiar vegetable acid called the *Meconic Acid*, and probably also with sulphuric acid; for the process by which the hydrochlorate is obtained, see MORPHIÆ HYDROCHLORAS.

Process.—When ammonia is added to the solution of hydrochlorate of morphia, this alkali having greater affinity for the acid than the morphia has, hydrochlorate of ammonia is formed, and remains in solution, while the morphia being quite or nearly insoluble in water is precipitated.

Properties.—Morphia is precipitated by the ammonia in a flocculent state, and on stirring and standing it assumes a crystalline appearance; it is colourless and has a bitter taste. According to Berzelius it is insoluble in cold water, and boiling water dissolves rather more than $\frac{1}{100}$ of its weight, the solution on cooling yields crystals; the hot solution turns turmeric paper brown, thus evincing its alkaline property. It is soluble in 40 parts of cold anhydrous alcohol and 30 parts when boiling; in æther it is nearly insoluble; it is dissolved by the volatile and fixed oils. Potash and soda take it up in considerable quantity, and ammonia in smaller proportion. When heated strongly in the air it emits a resinous smell, smokes and burns with a lively red flame, yields carbonate of ammonia, and leaves charcoal.

The crystals obtained by spontaneous evaporation from alcohol have a pearly lustre, and their primary form is a *right rhombic prism*, only the lateral planes of which appear on the crystals; one cleavage only has been obtained parallel to the plane *h*.



M on M′	127°20′
M on *h*	116 20
h on *c*	132 20
c on *c*′	95 20

Composition.—Morphia has been repeatedly analysed; the results do not greatly differ; it appears to consist of, in its anhydrous state,

Twenty equivalents of Hydrogen .	$1 \times 20 =$	20	or 6·85
Thirty-five equivalents of Carbon	$6 \times 35 =$	210	„ 71·91
Six equivalents of Oxygen	$8 \times 6 =$	48	„ 16·44
One equivalent of Azote.		14	„ 4·80
Equivalent.		292.	100·

The crystals contain two equivalents of water, or consist of

One equivalent of Morphia . .	292	or 94·2
Two equivalents of Water . .	18	„ 5·8
Equivalent. .	310.	100·

Symbol,—Berzelius and Turner.. $H^{20} C^{35} O^{6} N$.
Brande .... MOR.

Impurities and Tests.—See Notes: MORPHIA.
Pharmacopœia Preparation.—Morphiæ Acetas.
Medicinal Use.—See MORPHIÆ ACETAS and MORPHIÆ HYDROCHLORAS.

MORPHIÆ ACETAS.

Acetate of Morphia.

Take of Morphia six drachms,
Acetic Acid three fluidrachms,
Distilled Water four fluidounces;
Mix the Acid with the Water and pour them upon the Morphia to saturation. Let the Liquor evaporate with a gentle heat that crystals may be formed.

Properties.—Acetate of Morphia crystallizes, with some difficulty, in nearly colourless radiating needles, and during the evaporation of the solution a part of the acid is sometimes dissipated, and a portion of the acetate, suffering at least partial decomposition, becomes insoluble in water, and requires an addition of acetic acid to dissolve it; acetate of morphia is very soluble in water, especially when there is a slight excess of acetic acid, and less so in alcohol. It is decomposed, like the other salts of morphia, by ammonia, potash, soda, &c., the morphia being precipitated. It is decomposed, and its elements are totally dissipated by a strong heat.

Composition.—Acetate of Morphia is composed of

One equivalent of Acetic Acid ..	51	or	14·50
One equivalent of Morphia	292	,,	82·95
One equivalent of Water........	9	,,	2·55
Equivalent ..	352.		100·

Impurities and Tests.—See Notes: MORPHIÆ ACETAS.

Symbols,—Berzelius and Turner $H^{20} C^{35} O^{6} N, H^{3} C^{4} O^{3}$.
Brande .... $(\text{MOR} + ac')$.

Incompatibles.—The stronger acids, the alkalis and alkaline earths, and many or most earthy and metallic salts.

Medicinal Uses.—Morphia is perhaps the most active principle of opium, but owing to its sparing solubility in water is never used alone medicinally. Its combinations with either the acetic or hydrochloric acids form salts, which being soluble admit of being exhibited in very small doses and with great effect. The advantage which they seem to possess over opium is chiefly ascribed to the absence of narcotina; their use in ordinary cases not being followed by either headache or sickness. The dose is from gr. $\frac{1}{8}$ to gr. $\frac{1}{4}$.

MORPHIÆ HYDROCHLORAS.

Hydrochlorate of Morphia.

Take of Opium, sliced, a pound,
Crystals of Chloride of Lead two ounces, or as much as may be sufficient,
Purified Animal Charcoal three ounces and a half,
Hydrochloric Acid,
Distilled Water,
Solution of Ammonia, each as much as may be sufficient;

Macerate the Opium in four pints of distilled Water for thirty hours, and bruise it; afterwards, being digested for twenty hours more, press it. Macerate what remains again and a third time in water, that it may become free from taste, and as often bruise and press it. Evaporate the mixed liquors, with a heat of 140°, to the consistence of a syrup. Then add three pints of distilled Water, and when all the dregs have subsided pour off the supernatant liquor. Gradually add to this two ounces of Chloride of Lead, or as much as may be sufficient, first dissolved in four pints of boiling distilled Water, till nothing more is precipitated. Pour off the liquor and

wash what remains frequently with distilled Water. Next evaporate the liquors mixed together, with a gentle heat, as before, that crystals may be formed. Press these in a cloth, then dissolve them in a pint of distilled Water, and digest with an ounce and a half of Animal Charcoal, in a heat of 120°, and strain. Lastly, the Charcoal being washed, evaporate the liquors cautiously that pure crystals may be produced. To the liquor poured off from the crystals first separated, a pint of water being added to it previously, gradually pour in, frequently shaking it, as much Solution of Ammonia as may be sufficient to precipitate all the Morphia. To this, washed with distilled Water, add Hydrochloric Acid, that it may be saturated: afterwards digest it with two ounces of Animal Charcoal and strain. Finally, the Charcoal being thoroughly washed, evaporate the liquors cautiously, that pure crystals may be produced.

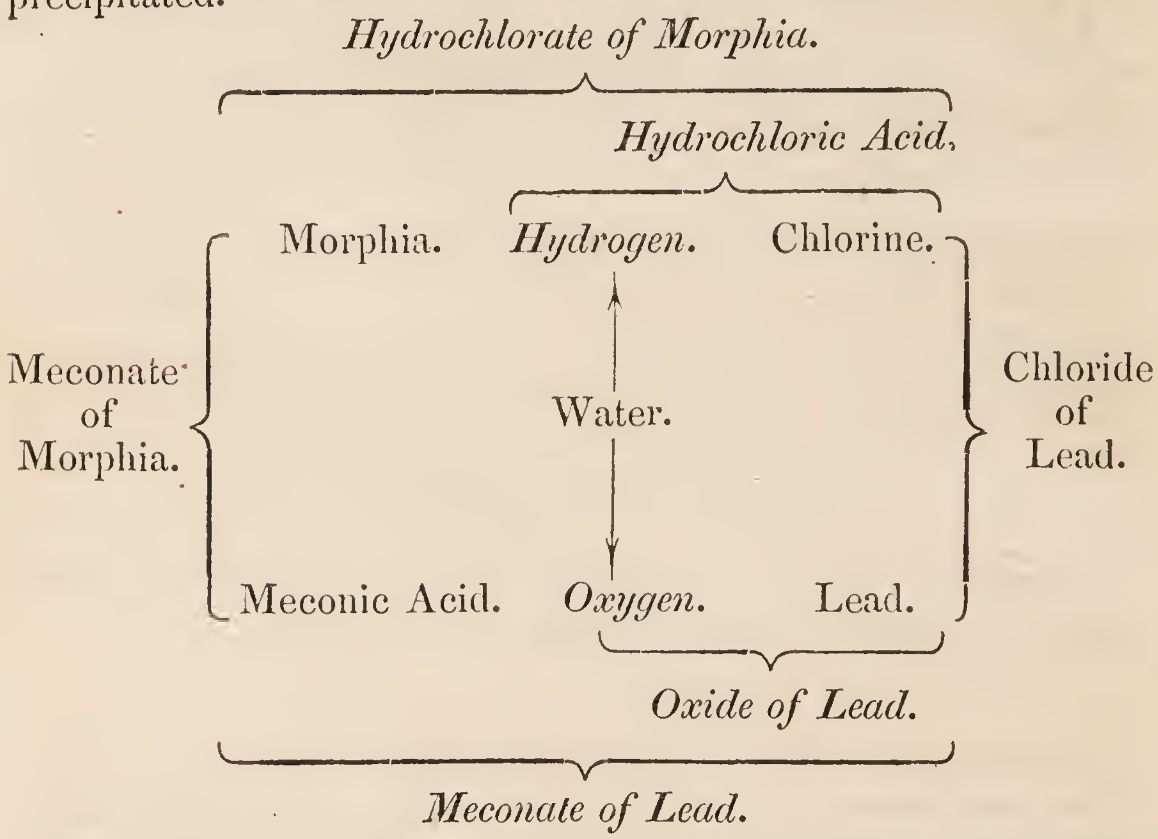
Remarks.—Opium, the inspissated juice of the *Papaver somniferum*, contains various secondary principles, consisting of acids, alkalis, and neutral compounds; those which are peculiar are

Meconic Acid.	
Morphia.	Alkalis.
Paramorphia or Thebaia.	Alkalis.
Codeia.	Alkalis.
Narcotina.	Alkalis.
Narceia.	Alkalis.
Meconin.	Neutral.

Besides these it contains several other secondary principles, some of which are met with in other vegetable products, viz. sulphuric acid, potash, lime, gum, bassorin, caoutchouc, lignin, extract, fixed oil, and a volatile principle. For an account of these I refer to works on chemistry; in a medicinal point of view morphia is the only substance of much importance.

Process.—Morphia exists in opium combined principally with meconic acid, forming meconate of morphia; the first step in the process is to procure an aqueous solution of the soluble portion of opium, and this contains the meconate of morphia. When a solution of chloride of lead is added to it, it decomposes and is decomposed by water, owing to the interference of the meconate;

the hydrogen of the water unites with the chlorine to form hydrochloric acid, and its oxygen with the lead to form oxide of lead; the morphia of the meconate combines with the hydrochloric acid, and constitutes with it hydrochlorate of morphia, which remains in solution, and the oxide of lead unites with the meconic acid of the meconate, and forms meconate of lead, which is precipitated.



As the solution of opium contains some sulphuric acid, a little sulphate of lead will also be precipitated with the meconate of lead.

A quantity of hydrochlorate of morphia remains in solution, after the separation of the crystals, which is directed to be decomposed by ammonia, as explained under the head of Morphia, and this being redissolved in hydrochloric acid yields crystals of the hydrochlorate by evaporation. The animal charcoal is employed to render the salt colourless, which it effects by its well-known decolorizing power.

Properties and Composition.—Hydrochlorate of Morphia, commonly called muriate of morphia, is a colourless, inodorous, bitter salt, which crystallizes in plumose acicular crystals; it is soluble in 16 to 20 times its weight of water, and when boiling water is saturated with it, a crystalline mass is formed as the solution cools. It is also soluble in alcohol. It is totally decomposed and dissipated by exposure to a red heat. It consists of

One equivalent of Hydrochloric Acid ..	37	or	11·25
One equivalent of Morphia	292	,,	88·75
Equivalent..	329.		100·

It is generally stated that this salt is anhydrous, but Mr. Hennell believing the contrary to be the case, supplied me with some dried by exposure to the air, which tried by Mr. Sandall in my laboratory, yielded 14·33 per cent. of water. Crystallized Hydrochlorate of Morphia therefore consists of

One equivalent of Hydrochlorate of Morphia	329	or	85·9
Six equivalents of Water .... $9 \times 6 =$	54	„	14·1
Equivalent ..	383.		100·

Symbol,—Berzelius and Turner .. $H^{20} C^{35} O^{6} N, HCl, 6HO$.
Brande .... (Mor.+*mur′*+6*q*.)

Impurities and Tests.—See Notes: Morphiæ Hydrochloras.
Pharmacopœia Use,—Morphia.
Medicinal Uses.—The hydrochlorate may be justly preferred to the acetate of morphia, being more easily obtained in crystals, and not so subject to decomposition, during its preparation.

QUINÆ DISULPHAS.

Disulphate of Quina.

Take of Heart-leaved Cinchona, bruised, seven pounds,
Sulphuric Acid nine ounces,
Purified Animal Charcoal two ounces,
Hydrated Oxide of Lead,
Solution of Ammonia,
Distilled Water, each as much as may be sufficient;

Mix four ounces and two drachms of the Sulphuric Acid with six gallons of distilled Water, and to these add the Cinchona; boil for an hour and strain. In like manner again boil what remains in Acid and Water, mixed in the same proportions, for an hour, and again strain. Lastly, boil the Cinchona in eight gallons of distilled water for three hours, and strain. Wash what remains frequently with boiling distilled water. To the mixed liquors add Oxide of Lead while moist, nearly to saturation. Pour off the supernatant liquor, and wash

what is precipitated with distilled water. Boil the liquors for a quarter of an hour, and strain; then gradually add Solution of Ammonia to precipitate the Quina. Wash this until nothing alkaline is perceptible. Let what remains be saturated with the rest of the Sulphuric Acid, diluted. Afterwards digest with two ounces of Animal Charcoal, and strain. Finally, the Charcoal being thoroughly washed, evaporate the liquor cautiously, that crystals may be produced.

Remarks.—The different varieties of Cinchona contain two vegetable alkalis, Quina and Cinchonia: the *Cinchona cordifolia*, or yellow bark, contains chiefly quina; the *Cinchona lancifolia*, or pale bark, cinchonia; and the *Cinchona oblongifolia*, or red bark, yields both of them. The Quina exists in combination with a peculiar acid called Kinic Acid, forming with it Kinate of Quina, which is soluble to a certain extent in water, and is rendered more so by the sulphuric acid employed in the process, and perhaps by decomposing it. Whatever may be the state of combination, the solution contains sulphuric acid, kinic acid, and quina, mixed with extractive and colouring matter, the last being removed by the animal charcoal. On adding oxide of lead the sulphuric acid combines with it, and the resulting sulphate being insoluble, is precipitated, while the kinic acid and quina remain in solution; when ammonia is added after the separation of the sulphate of lead, the kinic acid unites with it and the kinate of ammonia formed is soluble, while the quina is precipitated, and this when afterwards combined with sulphuric acid forms disulphate of quina, which crystallizes.

Sulphuric Acid Oxide of Lead.	Kinic Acid Ammonia.	Quina Sulphuric Acid.
Sulphate of Lead.	*Kinate of Ammonia.*	*Sulphate of Quina.*

Properties and Composition of Quina.—When precipitated from pure sulphate of quina by ammonia it is flaky, colourless, inodorous, and very bitter. It is scarcely soluble in water; to proper tests it is alkaline, and it saturates acids. It is soluble in alcohol, and the solution by spontaneous evaporation in a dry place, during winter, yields small crystals, which contain water. Crystals may also be obtained by dissolving quina in weak alcohol, and adding water till the solution begins to be milky; after some days' ex-

posure to the air a fluid of a resinous appearance separates, which gradually becomes radiated acicular crystals. Quina is also soluble in æther, and slightly in the volatile and fixed oils, when heated.

When quina is dried it is apt to become brown; when more strongly heated it is rendered still darker-coloured, fuses, becomes viscid, decomposes with the formation and evolution of carbonate of ammonia, and charcoal remains; and this is dissipated when ignited in the air.

Quina is composed of

Twelve equivalents of Hydrogen	$1 \times 12 =$	12	or	7·4
Twenty equivalents of Carbon . .	$6 \times 20 =$	120	,,	74·0
Two equivalents of Oxygen	$8 \times 2 =$	16	,,	9·9
One equivalent of Azote		14	,,	8·7
	Equivalent. .	162.		100·

Symbol,—Berzelius and Turner $H^{12} C^{20} O^2 N$.
Brande . . . . $(12h + 20car + 2o + n)$ or QUI.

Sulphate of Quina.—The sulphate composed of one equivalent of acid and base, though neutral in composition, is acid to litmus paper, but is not sour to the taste. It may be prepared by crystallizing a solution of sulphate of quina, the acid of which has not dissolved as much of the alkali as it is capable of combining with. This salt effloresces when exposed to the air, crystallizes in square prisms, is soluble in 11 times its weight of water at 55°, and in 8 times at 72°. At 212° it fuses in its water of crystallization. It is soluble in alcohol, and is totally destroyed by ignition.

It is composed of

One equivalent of Sulphuric Acid		40	or	14·6
One equivalent of Quina		162	,,	59·1
Eight equivalents of Water .	$9 \times 8 =$	72	,,	26·3
		274.		100·

Symbol,—Berzelius and Turner. . $H^{12} C^{20} O^2 N, SO^3, 8HO$.
Brande . . . . $(QUI + S' + 8q.)$

This salt is not employed in medicine.

Properties of Disulphate of Quina, P.L.—The crystals of this salt are colourless, acicular, have a pearly lustre, a bitter taste, and effloresce when exposed to the air; one part requires for solution about 740 parts of cold, 30 of boiling water, 80 of cold

alcohol of specific gravity 0·850, and much less if boiling. When heated, disulphate of quina fuses and has the appearance of melted wax; it afterwards reddens, begins to decompose, and when the heat is raised to ignition in the air, charcoal is obtained, which is eventually dissipated.

Composition.—This salt consists of

One equivalent of Sulphuric Acid..	40	or	9·17
Two equivalents of Quina	$162 \times 2 = 324$	,,	74·31
Eight equivalents of Water	$9 \times 8 = 72$	,,	16·52
Equivalent........	436.		100·

By exposure to the air or to a temperature of 212° half the water is expelled, and when heated to 240° it loses half the remainder, retaining only two equivalents; it is questionable whether more can be expelled without at the same time decomposing the salt.

Symbol,—Berzelius and Turner.. $2H^{12}C^{20}O^{2}N, SO^{3}, 8HO$.
Brande .... $(Qui^{2} + S' + 8q.)$

Impurities and Tests.—See Notes: QUINÆ DISULPHAS.

Incompatibles.—Alkalis, their carbonates and lime-water; these separating the sulphuric acid and precipitating the quina. The soluble salts of barytes, lead, &c., precipitate the sulphuric acid.

Medicinal Uses and Dose.—Quinæ Disulphas is a prominent example of the advantages which Medicine has derived from Chemistry. It possesses all the virtues of the cinchona, unmixed with inert or superfluous substances, such as the woody fibre or resin. Dose, from gr. iij. to gr. x.

STRYCHNIA.

Strychnia.

Take of Nux Vomica, bruised, two pounds,
Rectified Spirit three gallons,
Diluted Sulphuric Acid,
Magnesia,
Solution of Ammonia, each as much as may be sufficient;

Boil the bruised Nux Vomica with a gallon of the Spirit for an hour in a retort, to which a receiver is adapted. Pour off the liquor, and again and a third time boil what remains with another gallon of Spirit, and the Spirit recently distilled, and pour off the liquor. Press the Nux Vomica, and let the Spirit distil from the mixed and strained liquors. Evaporate what remains to the proper consistence of an extract. Dissolve this in cold Water and strain. Evaporate the liquor with a gentle heat until it has the consistence of a Syrup. To this while warm gradually add the Magnesia to saturation, shaking them together. Set it aside for two days, then pour off the supernatant liquor. Press what remains wrapped in a linen cloth. Boil it in Spirit, then strain, and let the Spirit distil. Add to the residue a very little diluted Sulphuric Acid mixed with Water, and macerate with a gentle heat. Set it aside for twenty-four hours that crystals may form. Press and dissolve them. Afterwards to these dissolved in Water add Ammonia, frequently shaking them, that the Strychnia may be precipitated. Lastly, dissolve this in boiling Spirit, and set it aside that pure crystals may be produced.

Remarks.—The vegetable alkali Strychnia was discovered in 1818 by Pelletier and Caventou, who procured it from the *Strychnos nux vomica*, and hence its name. It is contained also in some other species of Strychnos, and exists in them combined with an acid originally, and yet sometimes, called *Igasuric Acid*, but now usually termed *Strychnic Acid*. The *upas* also contains strychnia.

Process.—Nux Vomica consists of strychnate of strychnia strychnate of brucia, which is another vegetable alkali, colouring matter, gum, bassorin, starch, wax, fixed oil and lignin; when reduced to powder and digested in spirit, the strychnate of strychnia is dissolved with some admixture. After distilling the alcohol, the magnesia added decomposes the strychnate of strychnia, the base of which remains mixed with the magnesian salt formed, and any excess of magnesia used; when this mixture is digested in spirit, the strychnia is dissolved: and this being left after distillation, is taken up by dilute sulphuric acid, and the

resulting sulphate of strychnia is crystallized, dissolved in water, and decomposed by ammonia, which, combining with the sulphuric acid, the strychnia on account of its insolubility precipitates, and this again dissolved in boiling spirit, crystallizes by cooling and spontaneous evaporation.

	Strychnate of Magnesia.	
Strychnate of Strychnia.	Strychnic Acid.	Magnesia.
	Strychnia.	

	Sulphate of Ammonia.	
Sulphate of Strychnia.	Sulphuric Acid.	Ammonia.
	Strychnia.	

Properties.—Strychnia is colourless, inodorous, crystalline, unalterable by exposure to the air; it is so extremely bitter as to impart that taste to 600,000 times its weight of water. It requires about 6600 times its weight of cold, and 2500 times its weight of boiling water for solution. It is insoluble in absolute alcohol or in æther; alcohol even of 0·820 specific gravity scarcely dissolves any when cold, but in diluted alcohol it is more soluble. By rapid evaporation of the alcoholic solution it is deposited in a granular state, but by spontaneous evaporation it is procured in the form of the octahedron and square prisms, terminated by flat four-sided pyramids.

It acts like the alkalis on vegetable colours, and neutralizes acids, and forms salts with them.

It is extremely poisonous; one-eighth of a grain is sufficient to kill a dog, and a quarter of a grain produces a decided effect upon a man. When heated it is decomposed, and yields the same products as similarly constituted compounds. As usually obtained it is probably mixed with some *brucia*, another extremely powerful vegetable alkali.

Composition.—It is composed of

Sixteen equivalents of Hydrogen....	1 × 16 =	16	or 6·8
Thirty equivalents of Carbon	6 × 30 =	180	„ 77·0
Three equivalents of Oxygen	8 × 3 =	24	„ 10·2
One equivalent of Azote		14	„ 6·0
Equivalent		234.	100·

Symbol,—Berzelius and Turner .. H^{16} C^{30} O^{3} N.
Brande.............. $(16h+30car+3o+n)$.

Impurities and Tests.—See Notes: STRYCHNIA.

Incompatibles.—Acids and acidulous salts, which neutralize it. It probably decomposes some earthy and metallic salts by combining with their acid.

Medicinal Use.—This alkali, which is one of the most virulent furnished by the vegetable kingdom, has been exhibited with very variable results in paralytic affections. Dose, gr. $\frac{1}{16}$ to gr. $\frac{1}{8}$.

VERATRIA.

Veratria.

Take of Cevadilla, bruised, two pounds.
Rectified Spirit three gallons,
Diluted Sulphuric Acid,
Solution of Ammonia,
Purified Animal Charcoal,
Magnesia, each, as much as may be sufficient;

Boil the Cevadilla with a gallon of the Spirit for an hour in a retort, to which a receiver is adapted. Pour off the liquor, and again boil what remains with another gallon of Spirit and the Spirit recently distilled, and pour off the liquor: and let it be done a third time. Press the Cevadilla and let the Spirit distil from the mixed and strained liquors. Evaporate what remains to the proper consistence of an extract. Boil this three times or oftener in Water, to which a little diluted Sulphuric Acid is added, and with a gentle heat evaporate the strained liquors to the consistence of a syrup. To this, when cold, put in the Magnesia to saturation, frequently shaking them; then press and wash. Let this be done twice or three times; then dry what remains, and digest with a gentle heat in

Spirit twice or three times, and strain as often. Afterwards let the Spirit distil. Boil the residue in Water, to which a little Sulphuric Acid and Animal Charcoal are added, for a quarter of an hour, and strain. Lastly, the Charcoal being thoroughly washed, evaporate the [mixed] liquors cautiously until they have the consistence of a syrup, and pour into them as much Ammonia as may be sufficient to precipitate the Veratria. Separate this and dry it.

Remarks.—Veratria is a vegetable alkali, which, as well as Strychnia, was discovered by Pelletier and Caventou, in 1819. It was originally procured, as its name imports, from the *Veratrum album*, or white hellebore; it is now generally and with greater facility obtained from *Cevadilla*, the seeds of the *Helonias officinalis*. In both these substances the alkali is combined with veratric acid, forming veratrate of veratria.

Process.—By being boiled in spirit as directed, the cevadilla yields veratrate of veratria, colouring matter, and some other compounds. When the residue, after the distillation of the alcohol, is treated with sulphuric acid, there are formed sulphate, and probably also superveratrate of veratria.

Veratrate of Veratria.

Veratric Acid. Veratria. Sulphuric Acid.

Superveratrate and Sulphate of Veratria.

The superveratrate and sulphate of veratria are then decomposed by magnesia, and the veratria, set free, is separated from much of the matter with which it is mixed, by digestion and solution in spirit.

Veratrate and Sulphate of Magnesia.

Superveratrate and Sulphate of Veratria.
- Veratric and Sulphuric Acids. — Magnesia.
- Veratria.

When the spirit is distilled, the veratria remaining is treated

with animal charcoal to deprive it of colour, and then dissolved in sulphuric acid, and the sulphate of veratria formed is decomposed by ammonia, sulphate of ammonia being formed and remaining in solution, while the veratria is precipitated on account of its insolubility.

Sulphate of Ammonia.

Sulphate of Veratria.
- Sulphuric Acid. — Ammonia.
- Veratria.

Properties.—This alkali is colourless and pulverulent; it is not crystallizable. It produces violent and dangerous sneezing; the taste is extremely acrid and burning. When taken internally it excites nausea and vomiting, and proves fatal to animals in small doses. Authors differ as to its point of fusion, but it becomes on cooling a transparent yellowish mass. When ignited in the air it is totally decomposed and dissipated. In cold water it is nearly insoluble, and boiling water dissolves only 1–1000dth of its weight, but the solution is acrid; alcohol dissolves veratria very readily. Veratria possesses the alkaline property of restoring the blue colour of litmus paper which has been reddened by acids, and also that of saturating and forming salts with acids, which crystallize with great difficulty. According to Couerbe, the veratria thus prepared contains at least two other principles, viz. sabadillin and veratrin.

Composition.—Veratria consists of

Twenty-two equivalents of Hydrogen ..	$1 \times 22 =$	22	or 7·63
Thirty-four equivalents of Carbon	$6 \times 34 =$	204	„ 70·83
Six equivalents of Oxygen	$8 \times 6 =$	48	„ 16·66
One equivalent of Azote..............		14	„ 4·88
		288.	100·

Symbols,—Berzelius and Turner.. $H^{22}\ C^{34}\ O^{6}\ N.$

Brande .... $(22h + 34car + 6o + n)$.

Impurities and Tests.—See Notes: VERATRIA.

Incompatibles.—See *Strychnia.*

Medicinal Use—This very powerful alkali in moderate doses increases all the secretions, and has been thought efficient, carefully exhibited, in gout and rheumatism. Dose, gr. $\frac{1}{8}$ to gr. $\frac{1}{4}$.

ANIMALIA.

PREPARATIONS FROM ANIMALS.

CARBO ANIMALIS PURIFICATUS.

Purified Animal Charcoal.

Take of Animal Charcoal a pound,
Hydrochloric Acid,
Water, each, twelve fluidounces;

Mix the Hydrochloric Acid with the Water, and pour it gradually upon the Charcoal, then digest for two days with a gentle heat, frequently shaking them. Set by, and pour off the supernatant liquor, then wash the Charcoal very frequently with water, until nothing acid is perceptible; lastly, dry it.

Remarks.—Bone is principally a compound of phosphate of lime and gelatin, with some carbonate of lime; when it is perfectly calcined with access of air, the whole of the gelatin is dissipated, and there remains white phosphate of lime mixed with a little carbonate (see *Cornu Ustum*); when, however, the heat is applied to the bone in vessels with small apertures, and it is not too long continued, a portion of the charcoal of the gelatin remains unconsumed, and mixed with the phosphate and carbonate of lime, it constitutes animal charcoal, usually termed *ivory black.* This charcoal possesses in a very high degree the power of removing animal and vegetable colouring matter, and is on this account largely used in sugar-refining; with this application of it, the phosphate and carbonate of lime do not interfere, and therefore are not separated. In several of the cases, however, in which it is applied to chemical uses, these earthy compounds would be acted upon by the acids which the solutions to be decolorized contain, as in preparing Veratria, &c. The Hydrochloric acid is therefore employed to dissolve the earthy phosphate and carbonate, and this it does without acting upon the charcoal. The solution contains phosphate of lime mixed with chloride of calcium.

Pharmacopœia Uses.—Aconitina, Morphiæ Hydrochloras, Quinæ Disulphas, Veratria.

CORNU USTUM.

Burnt Horn.

Cornu Cervinum Ustum, P.L. 1721.
Cornu Cervi Calcinatum, P.L. 1746.
Cornu Cervi Ustum, P.L. 1788.
Cornu Ustum, P.L. 1809, P.L. 1824.

Burn pieces of Horns in an open vessel until they become perfectly white; then powder and prepare them in the same manner as directed with respect to Chalk.

Remarks.—In this operation the whole of the gelatin of the horn is decomposed and dissipated, and the residue is phosphate of lime very nearly in a state of purity.

Properties.—Phosphate of lime is colourless, inodorous and insipid, it is soluble in most acids without decomposition, and is precipitated from them by ammonia, potash and their carbonates in a gelatinous state, but unaltered in composition. It is however decomposed by sulphuric acid, the results being a precipitate of sulphate of lime and phosphoric acid, or rather superphosphate of lime, which remains in solution. Phosphate of lime is perfectly insoluble in water, and undecomposable by heat, even when carbonaceous matter is present, but fuses when this is dissipated.

Composition.—Bone phosphate, sometimes called bone earth, is a subphosphate of lime, consisting, according to Berzelius, of three equivalents of acid and eight of lime; employing however the equivalent weights generally adopted by English chemists, it is a subsesquiphosphate of lime containing

One equivalent of Phosphoric Acid	36	or	46·15
One and a half equivalent of lime 28 + 14 =	42	„	53·85
Equivalent	78.		100·

Symbols,—Berzelius and Turner.. $1\frac{1}{2}CaO, PO^{2\frac{1}{2}}$.
Brande .... $(1\frac{1}{2}C + p')$.

This substance is not separately employed, but it enters into the composition of the Pulvis Antimonii Compositus; bone is, however, commonly substituted for it.

TESTÆ PRÆPARATÆ.

Prepared Shells.

Testæ Ostreorum Præparatæ, P.L. 1746, P.L. 1788.
Testæ Præparatæ, P.L. 1809, P.L. 1824.

Wash the Shells, first freed from impurities, with boiling water; then prepare them in the same manner as directed for Chalk.

Remarks.—Shell consists principally of carbonate of lime, but it is mixed with indurated albumen, which is the cause of the smell, resembling that of burnt horns, experienced when they are put into the fire.

Prepared shells are harder than prepared chalk and less readily acted upon by acids, and probably the animal matter which they contain retards their action: they were formerly used in the *Confectio aromatica*, but prepared chalk is now substituted.

AQUÆ DESTILLATÆ.

DISTILLED WATERS.

AQUA DESTILLATA.

Distilled Water.

Aqua Distillata, P.L. 1788, P.L. 1809.
Aqua Destillata, P.L. 1824.

Take of Water ten gallons;

First let two pints distil, which being thrown away, let eight gallons distil. Keep the distilled Water in a glass bottle.

Remarks.—Most spring and river waters contain impurities in solution; these are generally carbonic acid, carbonate of lime, sulphate of lime, and common salt. There are some preparations whose power is much diminished, and whose solutions are rendered turbid by these compounds. Such, more especially, are lime-water, acetate and diacetate of lead; and sulphate of iron

is even decomposed by the atmospheric air which water always contains. Water may be nearly deprived of carbonic acid, carbonate of lime, and atmospheric air, by mere ebullition; but at the same time, owing to the evaporation which takes place, the proportion of the other impurities is increased, and therefore water which has been long boiled, may be more impure even than before ebullition.

The following tests will determine the presence of the usual impurities :—

Lime Water.—If carbonic acid be present, this will cause precipitation of carbonate of lime before ebullition, but not after it.

Chloride of Barium.—If sulphate of lime be present, this will give a precipitate of sulphate of barytes insoluble in nitric acid.

Oxalate of Ammonia.—If this give a precipitate of oxalate of lime before the water is boiled, it may be owing to the presence either of carbonate or of sulphate of lime; but if only after ebullition, then to the presence of sulphate, provided chloride of barium gives also a precipitate.

Nitrate of Silver.—If common salt or any other chloride be contained in water, this re-agent will afford a precipitate of chloride of silver insoluble in nitric acid.

Properties.—Distilled water is colourless, transparent, inodorous, tasteless, and also vapid on account of the absence of air. No change occurs in its appearance on the addition of lime-water, oxalate of ammonia, nitrate of silver, diacetate of lead, or hydrosulphuric acid. A pint weighs, at 62°, 8750 grains, or 20 ounces avoirdupois; or one pound six ounces one drachm two scruples and a half, or ten grains less than eighteen ounces and a quarter, apothecaries weight.

Few chemists are, I believe, in the practice of keeping a still for the purpose of distilling water only; yet this ought to be done, or the distilled water will have a faint smell and taste of the last herbs which had been subjected to distillation.

AQUA ANETHI.

Dill Water.

Aqua Seminum Anethi, P.L. 1746.
Aqua Anethi, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Dill, bruised, a pound and a half,
Proof Spirit seven fluidounces,
Water two gallons;
Let a gallon distil.

Remarks.—The odour and pungency of plants frequently reside in an essential oil, and this has its volatility so much increased by the vapour of the boiling water, that they rise together in distillation, and a sufficient quantity of the oil is either dissolved by, or intimately mixed with, the water to impart the peculiar taste and smell of the plant, or the parts of it employed.

Distilled waters in some cases, however, are mixed with other principles besides the volatile oil: thus cinnamon water contains, according to Soubeiran, cinnamic acid; valerian and pepper water are not inserted in the Pharmacopœia; but the first contains acetic and valerianic acid; and the latter ammonia, according to Vauquelin. Distilled waters, it will be observed, are in some cases prepared directly from the oil instead of the plant which yields it.

Waters distilled from herbs are intended merely as vehicles for the exhibition of more important remedies; when they have been long kept, they undergo a kind of decomposition, and become mucilaginous and sour: this is intended to be prevented by the addition of a small quantity of spirit, which in former Pharmacopœias was directed to be mixed with the distilled product, but is now ordered to be distilled with the water.

AQUA CARUI.

Caraway Water.

Aqua Seminum Carui, P.L. 1746.
Aqua Carui, P.L. 1809, P.L. 1824.

Take of Caraway, bruised, a pound and a half,
Proof Spirit seven fluidounces,
Water two gallons;
Let a gallon distil.

AQUA FŒNICULI.

Fennel Water.

Aqua Fœniculi, P.L. 1746, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Fennel [Seeds], bruised, a pound and a half,
Proof Spirit seven fluidounces,
Water two gallons;
Let a gallon distil.

AQUA FLORUM AURANTII.

Orange Flower Water.

Aqua Florum Aurantiorum, P.L. 1721.

Take of Orange Flowers ten pounds,
Proof Spirit seven fluidounces,
Water two gallons;
Let a gallon distil.

AQUA CINNAMOMI.

Cinnamon Water.

Aqua Cinnamomi Tenuis, P.L. 1721.
Aqua Cinnamomi Simplex, P.L. 1746.
Aqua Cinnamomi, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Cinnamon, bruised, a pound and a half, *or*
Oil of Cinnamon two drachms,
Proof Spirit seven fluidounces,
Water two gallons;
Let a gallon distil.

Pharmacopœia Preparations.—Mistura Guaiaci, Mistura Spiritus Vini Gallici.

AQUA MENTHÆ PIPERITÆ.

Peppermint Water.

Aqua Menthæ Piperitidis Simplex, P.L. 1746.
Aqua Menthæ Piperitidis, P.L. 1788.
Aqua Menthæ Piperitæ, P.L. 1809, P.L. 1824.

Take of Peppermint, dried, two pounds, *or*
Oil of Peppermint two drachms,
Proof Spirit seven fluidounces,
Water two gallons;
Let a gallon distil.

AQUA MENTHÆ PULEGII.

Pennyroyal Water.

Aqua Pulegii Simplex, P.L. 1746.
Aqua Pulegii, P.L. 1788, P.L. 1809, P.L. 1824.

AQUA MENTHÆ VIRIDIS.

Spearmint Water.

Aqua Menthæ Vulgaris Simplex, P.L. 1746.
Aqua Menthæ Sativæ, P.L. 1788.
Aqua Menthæ Viridis, P.L. 1809, P.L. 1824.

These are prepared in the same manner as Peppermint Water; but when the fresh herb is employed in distilling either that or these, double the weight is to be used.

AQUA PIMENTÆ.

Pimenta Water.

Aqua Piperis Jamaicensis, P.L. 1746.
Aqua Pimento, P.L. 1788.
Aqua Pimentæ, P.L. 1809, P.L. 1824.

Take of Pimenta, bruised, a pound, *or*
Oil of Pimenta two drachms,
Proof Spirit seven fluidounces,
Water two gallons;
Let a gallon distil.

AQUA ROSÆ.

Rose Water.

Aqua Rosarum Damascenarum, P.L. 1721, P.L. 1746.
Aqua Rosæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Damask Roses ten pounds,
Proof Spirit seven fluidounces,
Water two gallons;
Let a gallon distil.

Pharmacopœia Preparations.—Mistura Moschi, Mistura Ferri Composita.

AQUA SAMBUCI.

Elder Water.

Aqua Florum Sambuci, P.L. 1721.

Take of Elder Flowers ten pounds, *or*
Oil of Elder two drachms,
Proof Spirit seven fluidounces,
Water two gallons;
Let a gallon distil.

Remarks.—According to Dr. Lewis, Elder flowers yield by distillation but a very small quantity of a viscid oil; and the use of the flowers is greatly to be preferred.

Several of the Distilled Waters above-mentioned may be prepared in a very short time, when wanted for more immediate use, by carefully triturating a drachm of any distilled Oil with a drachm of Carbonate of Magnesia, and afterwards with four pints of distilled Water. Lastly, let the water be strained.

CATAPLASMATA.

CATAPLASMS.

CATAPLASMA CONII.

Cataplasm of Hemlock.

Take of Extract of Hemlock two ounces,
Water a pint,
Mix, and add
Linseed, bruised, as much as may be sufficient to make it of a proper consistence.

Medicinal Uses.—This has been applied to irritable sores, and scrofulous glandular swellings.

CATAPLASMA FERMENTI.

Cataplasm of Yest.

Cataplasma Fermenti, P.L. 1809, P.L. 1824.

Take of Flour a pound,
Yest of Beer half a pint;
Mix, and apply a gentle heat until they begin to swell.

Medicinal Uses.—This is applied to painful and foul ulcers, and it is stated that it diminishes the fœtor of the discharge and hastens the sloughing of the sores. Its efficacy is supposed to depend upon the carbonic acid gas evolved during the fermentation occasioned by the yest.

CATAPLASMA LINI.

Cataplasm of Linseed.

Take of Water, boiling, a pint,
Linseed, powdered, as much as may be sufficient to make it of a proper consistence;
Mix.

CATAPLASMA SINAPIS.

Cataplasm of Mustard.

Cataplasma Sinapeos, P.L. 1788.
Cataplasma Sinapis, P.L. 1809, P.L. 1824.

Take of Linseed,
Mustard Seed, each powdered, half a pound,
Vinegar, boiling, as much as may be sufficient to make them of the consistence of a cataplasm.
Mix.

Medicinal Use.—This Cataplasm is stimulant and rubefacient; applied spread on cloth to the soles of the feet in the low stage of typhus fever, when stupor or delirium is present. It is also used in the same way in apoplexy and coma, and other cases in which there is great determination to the head.

CERATA.

CERATES.

CERATUM.

Cerate.

Ceratum, P.L. 1809.
Ceratum Simplex, P.L. 1809, edit. alt., P.L. 1824.

Take of Olive Oil four fluidounces,
Wax four ounces;
Add the Oil to the melted Wax, and mix.

Medicinal Use.—This is used as a cooling dressing, and as a basis for more active preparations.

CERATUM CALAMINÆ.

Cerate of Calamine.

Ceratum Epuloticum, P.L. 1746.
Ceratum Lapidis Calaminaris, P.L. 1788.
Ceratum Calaminæ, P.L. 1809, P.L. 1824.

Take of Calamine,
Wax, each half a pound,
Olive Oil sixteen fluidounces;
Mix the Oil with the melted Wax; then remove them from the fire, and when first they begin to thicken, add the Calamine, and stir constantly, until they cool.

Medicinal Use.—This Cerate, well known by the name of *Turner's Cerate*, is used as a dressing to excoriations and ulcers, and to burns after the inflammation has subsided.

CERATUM CANTHARIDIS.

Cerate of Cantharides.

Unguentum ad Vesicatoria, P.L. 1746.
Ceratum Cantharidis, P.L. 1788.
Ceratum Lyttæ, P.L. 1809.
Ceratum Cantharidis, P.L. 1824.

Take of Cantharides, rubbed to very fine powder, an ounce,
Cerate of Spermaceti six ounces;
Add the Cantharides to the Cerate softened by heat, and mix.

Medicinal Use.—This Cerate is employed to promote a discharge from a blistered surface; it generally answers the purpose, without exciting much irritation; but sometimes it occasions strangury, and produces swelling of the lymphatics, and general irritation.

CERATUM CETACEI.

Cerate of Spermaceti.

Ceratum Album, P.L. 1746.
Ceratum Spermatis Ceti, P.L. 1788.
Ceratum Cetacei, P.L. 1809, P.L. 1824.

Take of Spermaceti two ounces,
White Wax eight ounces,
Olive Oil a pint;
To the Spermaceti and Wax melted together add the Oil, and stir them with a spatula until they cool.

Medicinal Use.—This is a soft cooling dressing, and is a convenient basis for more active preparations.
Pharmacopœia Preparation.—Ceratum Cantharidis.

CERATUM HYDRARGYRI COMPOSITUM.

Compound Cerate of Mercury.

Take of the Stronger Ointment of Mercury,
Cerate of Soap, each four ounces,
Camphor an ounce;
Rub them together until they are incorporated.

Medicinal Use.—This is employed to promote the dispersion of indolent tumours.

CERATUM PLUMBI ACETATIS.

Cerate of Acetate of Lead.

Unguentum Saturninum, P.L. 1746.
Unguentum Cerussæ Acetatæ, P.L. 1788.
Ceratum Plumbi Superacetatis, P.L. 1809.
Ceratum Plumbi Acetatis, P.L. 1824.

Take of Acetate of Lead, powdered, two drachms,
White Wax two ounces,
Olive Oil eight fluidounces;
Dissolve the Wax in seven fluidounces of the Oil; then to these gradually add the Acetate of Lead separately rubbed with the rest of the Oil, and stir with a spatula until they incorporate.

Medicinal Use.—A cooling dressing in cases of burns and excoriations.

CERATUM PLUMBI COMPOSITUM.

Compound Cerate of Lead.

Ceratum Lithargyri Acetati, P.L. 1788.
Ceratum Lithargyri Acetati Compositum, P.L. 1788, edit. alt.
Ceratum Plumbi Compositum, P.L. 1809, P.L. 1824.

Take of Solution of Diacetate of Lead three fluidounces,
Wax four ounces,
Olive Oil half a pint,
Camphor half a drachm;

Mix the melted Wax with eight fluidounces of the Oil; then remove them from the fire, and, when first they begin to thicken, gradually add the Solution of Diacetate of Lead, and stir them constantly with a spatula until they cool; lastly, with these mix the Camphor dissolved in the rest of the Oil.

Medicinal Use.—This is commonly known by the name of *Goulard's Cerate.* It is applicable to the same cases as the preceding cerate. It is stated to be particularly serviceable in chronic ophthalmia of the tarsus, and for the increased secretion of tears, which so frequently affects the eyes of persons advanced in years.

CERATUM RESINÆ.

Cerate of Resin.

Ceratum Citrinum, P.L. 1746.
Ceratum Resinæ Flavæ, P.L. 1788.
Ceratum Resinæ, P.L. 1809, P.L. 1824.

Take of Resin,
Wax, each a pound,
Olive Oil sixteen fluidounces;

Melt the Resin and Wax together with a slow fire; then add the Oil, and press the Cerate while hot, through a linen cloth.

Medicinal Use.—This is commonly called *Yellow Basilicon.* It is employed as an application to foul and indolent ulcers.

Pharmacopœia Preparation.—Unguentum Cantharidis.

CERATUM SABINÆ.

Cerate of Savine.

Ceratum Sabinæ, P.L. 1809, P.L. 1824.

Take of Savine, bruised, a pound,
Wax half a pound,
Lard two pounds;

Mix the Savine with the Lard and Wax melted together; then press through a linen cloth.

Medicinal Use.—In those cases in which the use of Ceratum Cantharidis excites too much irritation, this has been recommended as a substitute.

CERATUM SAPONIS.

Cerate of Soap.

Ceratum Saponis, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Soap ten ounces,
Wax twelve ounces and a half,
Oxide of Lead, powdered, fifteen ounces,
Olive Oil a pint,
Vinegar a gallon;

Boil the Vinegar with the Oxide of Lead, over a slow fire, constantly stirring them until they incorporate; then

add the Soap, and boil again in like manner, until all the moisture is evaporated; lastly, with these mix the Wax first dissolved in the Oil.

Medicinal Use.—This Cerate is occasionally used as a cooling dressing.

Pharmacopœia Preparation.—Ceratum Hydrargyri Compositum.

CONFECTIONES.

CONFECTIONS.

CONFECTIO AMYGDALÆ.

Confection of Almond.

Confectio Amygdalæ, P.L. 1809.
Confectio Amygdalarum, P.L. 1809, edit. alt., P.L. 1824.

Take of Sweet Almonds eight ounces,
Acacia, powdered, an ounce,
Sugar four ounces;

The Almonds being first macerated in cold Water, and their skins removed, pound all the ingredients together until incorporated.

This Confection may be longer kept unchanged if the Almonds, Acacia and Sugar, separately powdered, are afterwards mixed. Then whenever the Confection is to be used, pound all the ingredients together until incorporated.

Remarks.—This Confection being subject to spoil, it is now very advantageously directed that the ingredients should be kept ready mixed in a dry state, and the water added to them when the confection is wanted for preparing Almond Mixture.

Pharmacopœia Preparation.—Mistura Amygdalæ.

CONFECTIO AROMATICA.

Aromatic Confection.

Confectio Raleighana, P.L. 1721.
Confectio Cardiaca, P.L. 1746.
Confectio Aromatica, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Cinnamon,
Nutmegs, each two ounces,
Cloves an ounce,
Cardamoms [husked] half an ounce,
Saffron two ounces,
Prepared Chalk sixteen ounces,
Sugar two pounds;

Rub the dry ingredients together to a very fine powder and keep them in a close vessel. And whenever the Confection is to be used, add water gradually, and mix until incorporated.

Medicinal Uses.—Stimulant. Cordial. Dose, gr. xx. to ʒj. or more. It is incompatible with acids, acidulous and metallic salts, on account of the carbonate of lime which it contains.

As this preparation when mixed with water is subject to ferment, and act upon the carbonate of lime, it is now advantageously directed to be kept dry, and water added when wanted. Another improvement is, probably, the substitution of prepared chalk for prepared shells; the chalk being much more easily levigated, the Confection is on this account less likely to be gritty.

CONFECTIO AURANTII.

Confection of Orange [Peel].

Conserva Flavedinis Aurantiorum, P.L. 1721.
Conserva Flavedinis Corticum Aurantiorum, P.L. 1746.
Conserva Corticis exterioris Aurantii Hispalensis, P.L. 1788.
Conserva Aurantii Hispalensis Corticis exterioris, P.L. 1788, edit. alt.
Confectio Aurantii, P.L. 1809.
Confectio Aurantiorum, P.L. 1809, edit. alt., P.L. 1824.

Take of Orange Peel, fresh, separated by a rasp, a pound,
Sugar three pounds;

Pound the Peel in a stone mortar with a wooden pestle; then, the Sugar being added, again pound until incorporated.

CONFECTIO CASSIÆ.

Confection of Cassia.

Diacasia cum Manná, P.L. 1721.
Electarium e Casiá, P.L. 1746.
Electuarium e Cassiá, P.L. 1788.
Electuarium Cassiæ, P.L. 1788, edit. alt.
Confectio Cassiæ, P.L. 1809, P.L. 1824.

Take of Cassia [pulp] half a pound,
Manna two ounces,
Tamarind [pulp] an ounce,
Syrup of Rose eight fluidounces;

Bruise the Manna, then dissolve it in the Syrup; afterwards mix in the Cassia and Tamarind [pulps], and evaporate the moisture until a proper consistence is attained.

Medicinal Use.—Purgative in doses of ʒij. to ℥j.

CONFECTIO OPII.

Confection of Opium.

Philonium Romanum, P.L. 1721.
Philonium Londinense, P.L. 1746.
Confectio Opiata, P.L. 1788.
Confectio Opii, P.L. 1809, P.L. 1824.

Take of Hard Opium, powdered, six drachms,
Long Pepper an ounce.
Ginger two ounces,
Caraway three ounces,
Tragacanth, powdered, two drachms,
Syrup sixteen fluidounces ;

Rub the dry ingredients together to a very fine powder, and keep them in a covered vessel. And whenever the Confection is to be used, add sixteen fluidounces of Syrup made hot, and mix.

Medicinal Use.—Narcotic. Stimulant. Dose, gr. x. to gr. xxx.

CONFECTIO PIPERIS NIGRI.

Confection of Black Pepper.

Confectio Piperis Nigri, P.L. 1824.

Take of Black Pepper,
Elecampane [Root], each a pound,
Fennel [Seeds] three pounds,
Honey, [despumated,]
Sugar, each two pounds ;

Rub the dry ingredients together, to a very fine powder, and keep them in a covered vessel. And whenever the Confection is to be used, the Honey being added, pound them until incorporated.

Medicinal Uses.—This preparation was introduced into the last Pharmacopœia; it is probably intended as a substitute for Ward's Paste for Piles, &c. Dose, from ʒj. to ʒij. With respect to Ward's Paste, Dr. Paris observes, that "it is principally useful in those cases attended with considerable debility, in leucophlegmatic habits, and when piles arise from a deficient secretion in the rectum;" in cases attended with inflammation it does harm.

CONFECTIO ROSÆ CANINÆ.

Confection of Dog Rose [Hips].

Conserva Fructûs Cynosbati, P.L. 1721, P.L. 1746.
Conserva Cynosbati, P.L. 1788.
Confectio Rosæ Caninæ, P.L. 1809, P.L. 1824.

Take of Dog Rose [pulp] a pound,
Sugar, powdered, twenty ounces;

Expose the Pulp of the Rose in an earthen vessel to a gentle heat; then add the Sugar gradually, and rub together until incorporated.

Medicinal Use.—This is principally employed as an agreeable vehicle for making up more active medicines into pills and electuaries.

CONFECTIO ROSÆ GALLICÆ.

Confection of Red Rose.

Conserva Florum Rosarum Rubrarum, P.L. 1821, P.L. 1746.
Conserva Rosæ Rubræ, P.L. 1788.
Confectio Rosæ Gallicæ, P.L. 1809, P.L. 1824.

Take of Red Rose [petals] a pound,
Sugar three pounds;

Pound the Rose petals in a stone mortar; then, the Sugar being added, pound them again until incorporated.

Medicinal Use.—This Confection is employed for the same purposes as the last.

CONFECTIO RUTÆ.

Confection of Rue.

Electuarium e Baccis Lauri, P.L. 1721, P.L. 1746.
Confectio Rutæ, P.L. 1809, P.L. 1824.

Take of Rue, dried,
Caraway,
Bay Berries, each an ounce and a half,
Sagapenum half an ounce,
Black Pepper two drachms,
Honey [despumated,] sixteen ounces ;

Rub the dry ingredients together to very fine powder and preserve them. Then, whenever the Confection is to be used, add the Honey to them, and mix them all.

Medicinal Use.—This Confection is employed as an antispasmodic in enemas only.

CONFECTIO SCAMMONII.

Confection of Scammony.

Electuarium Caryocostinum, P.L. 1721.
Electarium e Scammonio, P.L. 1746.
Electuarium e Scammonio, P.L. 1788.
Electuarium Scammonii, P.L. 1788, edit. alt.
Confectio Scammonii, P.L. 1809.
Confectio Scammoneæ, P.L. 1809, edit. alt., P.L. 1824.

Take of Scammony, powdered, an ounce and a half,
Cloves, bruised,
Ginger, powdered, each six drachms,
Oil of Caraway half a fluidrachm,
Syrup of Rose, as much as may be sufficient ;

Rub the dry ingredients together to very fine powder, and preserve them; then, whenever the Confection is to be used, the Syrup being gradually poured in, rub again; lastly, the Oil of Caraway being added, mix them all.

Medicinal Use.—This is a stimulating cathartic, and may be given in the dose of ʒss. to ʒj. It is but seldom used.

CONFECTIO SENNÆ.

Confection of Senna.

Electuarium Lenitivum, P.L. 1721.
Electarium Lenitivum, P.L. 1746.
Electuarium e Sennâ, P.L. 1788.
Electuarium Sennæ, P.L. 1788, edit. alt.
Confectio Sennæ, P.L. 1809, P.L. 1824.

Take of Senna eight ounces,
Figs a pound.
Tamarind [pulp],
Cassia [pulp],
Prunes [pulp], each half a pound,
Coriander four ounces,
Liquorice three ounces,
Sugar two pounds and a half,
Water three pints;

Rub the Senna with the Coriander, and by a sieve separate ten ounces of the mixed powder. Then boil down the Water, with the Figs and the Liquorice added, to one half; afterwards press out [the liquor] and strain it. Evaporate the strained liquor in a water-bath, until of the whole, twenty-four fluidounces remain; then, the Sugar being added, let a Syrup be made. Lastly, rub

the Pulps gradually with the Syrup, and the sifted powder being thrown in, mix them all.

Medicinal Use.—This is much employed as a laxative, but is generally very badly prepared, containing neither senna nor cassia, and is sold for one third the price which the genuine preparation costs. Dose, ℥ij. or more.

DECOCTA.

DECOCTIONS.

Decoctions differ from hot infusions only in the application of a longer-continued heat; by this the solvent power of the water is increased, and some substances which are sparingly dissolved by mere infusion in hot water, have their virtues readily extracted by boiling in it.

In some cases, however, infusions contain more of the active principle of medicines than decoctions; thus aromatics and substances which contain essential oils, are diminished in power by their volatilization during the long-continued action of the heat. Another circumstance to be noticed is this; that some of the principles, which are dissolved by hot water, are deposited as the solution cools; this is particularly the case with cinchona, and therefore this decoction should always be exhibited turbid, from the suspension of particles which had become insoluble by cooling. Decoctions ought always to be strained hot, for the reasons which have been just stated, and they should be prepared either with soft or with distilled water; undistilled water which has been long boiled should be especially avoided.

Decoctions suffer decomposition by being kept, in the same manner as infusions; and consequently they ought to be prepared only a very few hours before they are intended for use.

DECOCTUM ALOËS COMPOSITUM.

Compound Decoction of Aloes.

Decoctum Aloës Compositum, P.L. 1809, P.L. 1824.

Take of Extract of Liquorice seven drachms,
Carbonate of Potash a drachm,
Aloes, powdered,
Myrrh, powdered,
Saffron, each a drachm and a half,
Compound Tincture of Cardamom seven fluid-ounces,
Distilled Water a pint and a half;

Boil down the Liquorice, Carbonate of Potash, Aloes, Myrrh, and Saffron with the Water, to a pint, and strain; then add the Compound Tincture of Cardamom.

Medicinal Uses.—Mildly cathartic. Dose, from f℥ ss. to f℥ j.

Incompatibles.—Acids, acidulous salts, earthy and metallic salts, and all substances which are decomposed by carbonate of potash, or which decompose it.

The quantities of ingredients ordered in the present Pharmacopœia differ from those of the last, but the proportions, and consequently the strength of the preparation, remain the same.

DECOCTUM AMYLI.

Decoction of Starch.

Mucilago Amyli, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Starch four drachms,
Water a pint;

Rub the Starch with the Water gradually poured in, then boil a little while.

Remarks.—This Decoction should be prepared from Starch which is perfectly colourless, and not that which is generally employed for domestic purposes, since it is coloured by smalts, or powdered blue glass. It is used as a demulcent.

Pharmacopœia Preparation.—Enema Opii.

DECOCTUM CETRARIÆ.

Decoction of Liverwort.

Decoctum Lichenis, P.L. 1809, P.L. 1824.

Take of Liverwort five drachms,
Water a pint and a half;
Boil down to a pint, and strain.

Remarks.—Liverwort appears to contain two different principles, *lichenin* and *lichenic acid*; according to Herberger the latter possesses some alkaline properties.

Berzelius procured about 44 per cent. of lichenin from liverwort; the process is tedious; its properties are, that while it retains water it is white, but when dry yellowish; in thin plates it is transparent and tough; it has a slight smell of liverwort, and but little taste. When put into cold water it swells up into a kind of jelly, but does not dissolve, while in boiling water it dissolves, forming a mucilage, but when much concentrated a jelly. It is coloured blue by iodine; alcohol and æther precipitate the aqueous solution in white flocks; this solution becomes acid by exposure to the air for a few days. According to Herberger, who calls it *cetrarin,* lichenin is poisonous, and possesses the alkaline property of combining with acids, but the salts formed are not crystallizable.

By the action of sulphuric acid, lichenin is converted into anhydrous starch-sugar, whereas by nitric acid it yields oxalhydric and oxalic acids.

By analysis it yielded

Hydrogen........	7·28
Carbon..........	39·74
Oxygen	52·98
	100·

Lichenic Acid crystallizes in colourless needles; it has a strongly acid taste; when subjected to distillation it does not fuse, but volatilizes, without leaving charcoal; the white fumes which it yields have a peculiar aromatic odour.

It is composed of

Hydrogen........	3·44
Carbon..........	41·29
Oxygen	55·37
	100·

Medicinal Uses.—This decoction is mucilaginous and bitter; it is employed as a remedy in debility, phthisis, and disorders requiring nutritive tonics. Dose, from f℥j. to f℥iv.

DECOCTUM CHIMAPHILÆ.

Decoction of Winter Green or Pyrola.

Take of Winter Green or Pyrola an ounce,
Distilled Water a pint and a half;
Boil down to a pint, and strain.

Medicinal Uses.—It has been found useful in cases of dropsy and some affections of the urinary organs; its action is principally diuretic. Dose, from f℥j. to f℥iss.

DECOCTUM CINCHONÆ CORDIFOLIÆ.

Decoction of Heart-leaved Cinchona.

[*Yellow Bark.*]

Take of Heart-leaved Cinchona, bruised, ten drachms,
Distilled Water a pint;
Boil for ten minutes in a lightly-covered vessel, and strain the liquor while hot.

DECOCTUM CINCHONÆ LANCIFOLIÆ.

Decoction of Lance-leaved Cinchona.

[*Pale Bark.*]

Decoctum Corticis Peruviani, P.L. 1788.
Decoctum Cinchonæ, P.L. 1809, P.L. 1824.

Take of Lance-leaved Cinchona, bruised, ten drachms,
Distilled Water a pint;
Boil for ten minutes in a lightly-covered vessel, and strain the liquor while hot.

DECOCTUM CINCHONÆ OBLONGIFOLIÆ.

Decoction of Oblong-leaved Cinchona.
[*Red Bark.*]

Take of Oblong-leaved Cinchona, bruised, ten drachms,
Distilled Water a pint;

Boil for ten minutes in a lightly-covered vessel, and strain the liquor while lot.

Medicinal Uses.—Tonic in dyspepsia, &c. Dose from f℥j. to f℥iij. two or three times a day. Although cinchona in the form of decoction is less powerful than when exhibited in substance, yet in the former state it may be taken by persons with whom the powder would not agree.

Remarks.—The three varieties of cinchona contain two vegetable alkalis, namely, *quina* and *cinchonia*, in which their medicinal virtues reside; and it has been found by Pelletier and Caventou, and other chemists, that the alkali which the Pale Bark contains is chiefly cinchonia, and the Yellow, principally quina; while the Red Bark contains both these alkalis more nearly in equal proportions. The other differences existing between these varieties of cinchona are unimportant, as will appear by the annexed statement of their compounds.

	Pale Bark.	Yellow Bark.	Red Bark.
Superkinate of Cinchonia	+	+	+
Superkinate of Quina	+	+	+
Superkinate of Lime........	+	+	+
Tannic Acid (Tannin)	+	+	+
Red colouring matter	+	+	+
Yellow colouring matter	+	+	+
Gum	+	0	0
Starch	+	+	+
Fatty matter	+	+	+
Lignin	+	+	+

An account of the properties and composition of quina has already been given; cinchonia is usually prepared from the pale bark which contains it, on the same plan as quina is from yellow bark. Its properties are as follows: When the alcoholic solution is suffered to evaporate slowly the cinchonia separates in slender prismatic crystals; but when the evaporation is rapid it is deposited in colourless, translucent, crystalline plates. It requires 2500 times its weight of boiling water for solution, and in cold water it is nearly insoluble; it has a bitter taste, which is slowly

developed on account of its slight solubility; on the addition of an acid it becomes intensely bitter. It suffers no change by exposure to the air. It is very soluble in alcohol, especially when hot, and on cooling, crystals are deposited. It restores the colour of litmus which has been reddened, and combines with acids to form neutral and crystallizable salts. When strongly heated it is totally decomposed, yielding carbonate of ammonia among other products.

Cinchonia is composed of

Twelve equivalents of Hydrogen. .	$1 \times 12 =$	12	or	7·8
Twenty equivalents of Carbon. . . .	$6 \times 20 =$	120	,,	78·0
One equivalent of Oxygen		8	,,	5·2
One equivalent of Azote		14	,,	9·0
Equivalent. . . .		154.		100·

Symbol,—Berzelius and Turner . . $H^{12}\ C^{20}\ O\ N$.
Brande. . . . . Cin.

Medicinal Uses.—Being a much less powerful remedy than quina, it is not separately prepared for medicinal use.

DECOCTUM CYDONIÆ.

Decoction of Quince [Seeds.]

Mucilago Seminum Cydoniorum, P.L. 1746.
Mucilago Seminis Cydonii Mali, P.L. 1788.
Decoctum Cydoniæ, P.L. 1809, P.L. 1824.

Take of Quince [Seeds] two drachms,
Distilled Water a pint;
Boil with a slow fire for ten minutes; afterwards strain.

Medicinal Uses.—Quince seeds contain a large quantity of inodorous and insipid mucilaginous matter, which is readily dissolved by water. The decoction is viscid and nearly colourless; it has been recommended as an application to erysipelatous surfaces: it is also employed in aphthous affections and excoriations of the mouth, &c. It very speedily suffers decomposition, and on this account should never be kept ready prepared.

Incompatibles.—Alcohol, acids, and most metallic solutions.

DECOCTUM DULCAMARÆ.

Decoction of Woody Nightshade.

Decoctum Dulcamaræ, P.L. 1809, P.L. 1824.

Take of Woody Nightshade, sliced, ten drachms,
Distilled Water a pint and a half;
Boil down to a pint, and strain.

Remarks.—The active principle of the *Solanum dulcamara* is an alkali which has been named *Solania*; it is combined in the plant with malic acid; solania is colourless, pulverulent, and pearly. It is insoluble in cold water, and requires 8000 times its weight when boiling to dissolve it. In oil it is insoluble, sparingly soluble in æther, but readily in alcohol. It has the alkaline properties of restoring reddened litmus paper and saturating acids to form salts.

Solania is extremely poisonous, and according to Blanchet is composed of

Hydrogen	8·9
Carbon	62·0
Oxygen	27·5
Azote	1·6
	100·

The accuracy of this analysis is, however, questionable, since it would indicate the combination of a much greater number of equivalents than has hitherto been ascertained to occur.

Medicinal Uses.—Diuretic and narcotic. Dose, from f℥iv. to f℥j. three times a day, combined with an aromatic.

DECOCTUM GRANATI.

Decoction of Pomegranate.

Take of Pomegranate [Rind] two ounces,
Distilled Water a pint and a half;
Boil down to a pint, and strain.

Remarks.—The rind of the pomegranate is astringent, and contains gum, extract and tannin or tannic acid. The decoction is given in doses of f℥ss. to f℥j. It has been found useful in cases of tapeworm, as well as in dysentery.

DECOCTUM HORDEI.

Decoction of Barley.

Aqua Hordeata, P.L. 1746.
Decoctum Hordei, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Barley [Pearl Barley] two ounces and a half,
Water four pints and a half;

First wash away with water the foreign matters adhering to the Barley Seeds; afterwards, half a pint of the Water being poured upon them, boil the Seeds a little while. This Water being thrown away, pour on [the seeds] that which is left, first made hot; then boil down to two pints, and strain.

Pharmacopœia Preparations.—Decoctum Hordei Compositum, Enema Aloes, Enema Terebinthinæ.

DECOCTUM HORDEI COMPOSITUM.

Compound Decoction of Barley.

Decoctum Pectorale, P.L. 1721, P.L. 1746.
Decoctum Hordei Compositum, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Decoction of Barley two pints,
Figs, sliced, two ounces and a half,
Liquorice [Root], sliced and bruised, five drachms,
Raisins [stoned] two ounces and a half,
Water a pint;

Boil down to two pints, and strain.

Medicinal Uses.—This and the simple decoction are useful demulcents in fever, phthisis, gonorrhœa and strangury, given *ad libitum.*

DECOCTUM MALVÆ COMPOSITUM.

Compound Decoction of Mallow.

Decoctum Commune pro Clystere, P.L. 1721, P.L. 1746.
Decoctum pro Enemate, P.L. 1788.
Decoctum Malvæ Compositum, P.L. 1809, P.L. 1824.

Take of Mallow, dried, an ounce,
Chamomile, dried, half an ounce,
Water a pint;
Boil for a quarter of an hour, and strain.

Medicinal Uses.—Employed in fomentations and enemas.

DECOCTUM PAPAVERIS.

Decoction of Poppy.

Decoctum Papaveris, P.L. 1809, P.L. 1824.

Take of Poppy [Capsules], sliced, four ounces,
Water four pints;
Boil for a quarter of an hour, and strain.

Medicinal Uses.—Externally as an anodyne fomentation in painful swellings, and in the excoriations produced by the acrid discharge of ulcers.

DECOCTUM QUERCUS.

Decoction of Oak [Bark].

Decoctum Quercûs, P.L. 1809, P.L. 1824.

Take of Oak [Bark], bruised, ten drachms,
Distilled Water two pints;
Boil down to a pint, and strain.

Remarks.—The well-known astringent property of oak and similar barks has been ascribed to a proximate principle called *tannin,* on account of its power of converting skin into leather, and it has been lately found that they contain besides gallic acid a quantity of a peculiar acid in which the tanning power has been, at least partly, supposed to reside, called *tannic acid.* All vegetable matters which are employed in tanning give an insoluble precipitate with albumen and gelatin, and a dark-coloured one with the salts of iron, which has been called tanno-gallate of iron. The exact effect produced by each peculiar principle has not however been satisfactorily ascertained.

Medicinal Uses.—This decoction is principally employed in the form of gargle, injection, or lotion, as a local astringent. It is nearly inodorous and has a very astringent taste.

Incompatibles.—Decoction of cinchona, metallic salts, solution of isinglass, and alkaline solutions destroy its astringency.

DECOCTUM SARZÆ.

Decoction of Sarsaparilla.

Decoctum Sarsaparillæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Sarsaparilla, sliced, five ounces,
Distilled Water, boiling, four pints;
Macerate for four hours, in a lightly-covered vessel, near the fire, then take out and bruise the Sarsaparilla. When bruised, return it to the liquor, and again macerate in like manner for two hours; afterwards boil down to two pints, and strain.

Remarks.—The medicinal power of Sarsaparilla appears to exist in a peculiar neutral vegetable product called *Smilacin.*

Jamaica or *red* Sarsaparilla is preferable to the *Honduras* for the purpose of preparing the Decoction and Extract.

Medicinal Uses.—Alterative, demulcent. Dose, from f℥iv. to f℥viii. three or four times a day.

Incompatibles.—Lime-water and acetates of lead, and also some solutions of mercury.

Pharmacopœia Preparation.—Decoctum Sarzæ Compositum.

DECOCTUM SARZÆ COMPOSITUM.

Compound Decoction of Sarsaparilla.

Decoctum Sarsaparillæ Compositum, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Decoction of Sarsaparilla, boiling, four pints,
Sassafras, sliced,
Guaiacum Wood, rasped,
Liquorice [Root], bruised, each ten drachms,
Mezereon [Bark of the Root], three drachms;
Boil for a quarter of an hour, and strain.

Remarks.—The Mezereon is the only very active substance here added to the sarsaparilla; it contains a neutral vegetable matter called *Daphnin*, from the name of the root, *Daphne Mezereon.*

Medicinal Uses.—Diaphoretic and alterative. It is esteemed to be useful in secondary syphilis and in rheumatism. Dose, f℥iv. to f℥vi. three or four times a day.

DECOCTUM SCOPARII COMPOSITUM.

Compound Decoction of Broom.

Take of Broom [fresh tops],
Juniper Fruit,
Dandelion [Root], each half an ounce,
Distilled Water a pint and a half;
Boil down to a pint, and strain.

Medicinal Use.—This decoction is possessed of diuretic properties, which may be still further increased by the addition of small doses of tartrate or acetate of potash. It has been found efficient in dropsy.

DECOCTUM SENEGÆ.

Decoction of Senega.

Decoctum Senegæ, P.L. 1809, P.L. 1824.

Take of Senega ten drachms,
Distilled Water two pints;
Boil down to a pint, and strain.

Remarks.—Senega is supposed to contain a peculiar proximate principle, called *Senegin,* which is neutral, possessing neither acid nor alkaline properties.

Medicinal Uses.—Expectorant, diuretic, and diaphoretic. It has been recommended in pneumonic affections attended with accumulation of mucus in the bronchia, and as a diaphoretic in chronic rheumatism. Dose, f℥iss. to f℥iij. two or three times a day.

DECOCTUM TORMENTILLÆ.

Decoction of Tormentil.

Take of Tormentil, bruised, two ounces,
Distilled Water a pint and a half;
Boil down to a pint, and strain.

Medicinal Uses.—It has been found useful as an astringent and tonic, in diarrhœa and alvine fluxes. Dose, f℥j. to f℥iss. three or four times a day.

DECOCTUM ULMI.

Decoction of Elm [Bark].

Decoctum Ulmi, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Elm [Bark], fresh, bruised, two ounces and a half,
Distilled Water two pints;
Boil down to a pint, and strain.

Remarks.—Elm bark contains several proximate principles, among the rest tannin or tannic acid, but not in so great quantity as oak bark.

Medicinal Uses.—Diuretic, and in herpetic eruptions. Its powers are questionable. Dose, f℥iv. to f℥vj. three or four times a day.

DECOCTUM UVÆ URSI.

Decoction of Whortleberry.

Take of Whortleberry [Leaves], bruised, an ounce,
Distilled Water a pint and a half;
Boil down to a pint, and strain.

Medicinal Uses.—A good bitter, first recommended by De Haen, and subsequently very much employed in purulent and other affections of the urinary organs. Dose, f℥j. to f℥ij.

DECOCTUM VERATRI.

Decoction of White Hellebore.

Decoctum Hellebori, P.L. 1788.
Decoctum Hellebori Albi, P.L. 1788, edit. alt.
Decoctum Veratri, P.L. 1809, P.L. 1824.

Take of White Hellebore [Root], bruised, ten drachms,
Distilled Water two pints,
Rectified Spirit three fluidounces;

Boil the Hellebore in the Water down to a pint, and when it has cooled, add the Spirit, then press and strain.

Remarks.—The chief medicinal power of white Hellebore resides in a peculiar vegetable alkali, for an account of which see VERATRIA. According to Simon (Lond. and Edinb. Phil. Mag., vol. xii. p. 30), the hellebore root contains another alkali, which he has called *jervina*.

Medicinal Uses.—It is employed externally as a lotion in scabies, tinea capitis, and other cutaneous eruptions.

EMPLASTRA.

PLASTERS.

EMPLASTRUM AMMONIACI.

Plaster of Ammoniacum.

Emplastrum Ammoniaci, P.L. 1809, P.L. 1824.

Take of Ammoniacum five ounces,
Distilled Vinegar eight fluidounces;

Dissolve the Ammoniacum in the Vinegar; then evaporate the liquor, with a slow fire, constantly stirring, to a proper consistence.

Medicinal Uses.—Stimulant and discutient, applied to white swellings, scrofulous tumours, &c.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO.

Plaster of Ammoniacum with Mercury.

Emplastrum ex Ammoniaco cum Mercurio, P.L. 1746.
Emplastrum Ammoniaci cum Hydrargyro, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Ammoniacum a pound,
Mercury three ounces,
Olive Oil a fluidrachm,
Sulphur eight grains;

To the heated Oil gradually add the Sulphur, stirring constantly with a spatula, until they incorporate; then rub the Mercury with them, until globules are no longer visible; lastly, gradually add the Ammoniacum, melted, and mix them all.

Medicinal Uses.—Similar to the former, but more powerful, especially in venereal nodes.

EMPLASTRUM BELLADONNÆ.

Plaster of Deadly Nightshade.

Take of Plaster of Resin three ounces,
Extract of Deadly Nightshade an ounce and a half;

To the Plaster, melted with the heat of a water-bath, add the Extract, and mix.

Medicinal Uses.—Anodyne and antispasmodic. Applied to the sacrum it relieves pain in dysmenorrhœa.

EMPLASTRUM CANTHARIDIS.

Plaster of Cantharides.

Emplastrum Epispasticum, P.L. 1721.
Emplastrum Vesicatorium, P.L. 1746.
Emplastrum Cantharidis, P.L. 1788.
Emplastrum Lyttæ, P.L. 1809.
Emplastrum Cantharidis, P.L. 1824.

Take of Cantharides, rubbed to very fine powder, a pound,
Plaster of Wax a pound and a half,
Lard half a pound;

Sprinkle the Cantharides in the Plaster and Lard melted together, and removed from the fire, a little before they concrete, and mix them all.

Remarks.—In spreading this plaster, great care should be taken that heat be not employed, or that it be merely sufficient to soften the plaster; a high temperature decomposes the animal matter, and totally destroys its efficacy.

EMPLASTRUM CERÆ.

Plaster of Wax.

Emplastrum Attrahens, P.L. 1746.
Emplastrum Ceræ, P.L. 1788.
Emplastrum Ceræ Compositum, P.L. 1788, edit. alt.
Emplastrum Ceræ, P.L. 1809, P.L. 1824.

Take of Wax,
Suet, each three pounds,
Resin a pound;

Melt them together, and strain.

Pharmacopœia Preparation.—Emplastrum Cantharidis.

Medicinal Use.—This plaster is principally used as an ingredient in the preceding.

EMPLASTRUM GALBANI.

Plaster of Galbanum.

Diachylon Magnum cum Gummi, P.L. 1721.
Emplastrum Commune cum Gummi, P.L. 1746.
Emplastrum Lithargyri cum Gummi, P.L. 1788.
Emplastrum Lithargyri Compositum, P.L. 1788, edit. alt.
Emplastrum Galbani Compositum, P.L. 1809, P.L. 1824.

Take of Galbanum eight ounces,
Plaster of Lead three pounds,
Common Turpentine ten drachms,
Resin of the Spruce Fir, powdered, three ounces;

To the Galbanum and Turpentine melted together, first add the Resin of the Spruce Fir, then the Plaster of Lead, melted with a slow fire, and mix them all.

Medicinal Uses.—Stimulant. Discutient. It is more powerful than the preceding, and is said to be particularly serviceable in cases of indolent glandular enlargements of a strumous character.

EMPLASTRUM HYDRARGYRI.

Plaster of Mercury.

Emplastrum Mercuriale, P.L. 1721.
Emplastrum Commune cum Mercurio, P.L. 1746.
Emplastrum Lithargyri cum Hydrargyro, P.L. 1788.
Emplastrum Hydrargyri, P.L. 1809, P.L. 1824.

Take of Mercury three ounces,
Plaster of Lead a pound,
Olive Oil a fluidrachm,
Sulphur eight grains;

To the heated Oil add the Sulphur gradually, stirring constantly with a spatula until they incorporate; afterwards rub the Mercury with them, until globules are no longer visible; then gradually add the Plaster of Lead melted with a slow fire, and mix them all.

Medicinal Uses.—Alterative. Discutient. It is less powerful than the Emplastrum Ammoniaci cum Hydrargyro.

EMPLASTRUM OPII.

Plaster of Opium.

Emplastrum Opii, P.L. 1809, P.L. 1824.

Take of Hard Opium, powdered, half an ounce,
Resin of the Spruce Fir, powdered, three ounces,
Plaster of Lead a pound,
Water eight fluidounces;

To the melted Plaster add the Resin of the Spruce Fir, the Opium, and the Water, and with a slow fire boil down, until all unite into a proper consistence.

Medicinal Use.—Anodyne.

EMPLASTRUM PICIS.

Plaster of Pitch.

Emplastrum Cephalicum, P.L. 1746.
Emplastrum Picis Burgundicæ, P.L. 1788.
Emplastrum Picis Burgundicæ Compositum, P.L. 1788, edit. alt.
Emplastrum Picis Compositum, P.L. 1809, P.L. 1824.

Take of Burgundy Pitch two pounds,
Resin of the Spruce Fir a pound,
Resin,
Wax, each four ounces,
Expressed Oil of Nutmegs an ounce,
Olive Oil,
Water, each two fluidounces;

To the Pitch, Resin and Wax melted together, add first the Resin of the Spruce Fir, then the Oil of Nutmegs, the Olive Oil, and the Water. Lastly, mix them all, and boil down to a proper consistence.

Medicinal Uses.—Stimulant. Rubefacient in pulmonary complaints; but it frequently produces too great a degree of irritation.

EMPLASTRUM PLUMBI.

Plaster of Lead.

Diachylon Simplex, P.L. 1721.
Emplastrum Commune, P.L. 1746.
Emplastrum Lithargyri, P.L. 1788.
Emplastrum Plumbi, P.L. 1809, P.L. 1824.

Take of Oxide of Lead, rubbed to very fine powder, six pounds,
Olive Oil a gallon,
Water two pints;

Boil them together with a slow fire, constantly stirring, until the Oil and Oxide of Lead unite into the consistence of a plaster; but it will be proper to add a little boiling Water, if nearly the whole of that which was used in the beginning should be evaporated before the end of the boiling.

Medicinal Uses.—It is largely employed in the bases of many other plasters, and is a common application to excoriations, and for retaining the edges of fresh-cut wounds in a state of apposition, and defending them from the air.

Pharmacopœia Preparations.—Emplastrum Galbani, Emplastrum Hydrargyri, Emplastrum Opii, Emplastrum Resinæ, Emplastrum Saponis, Unguentum Plumbi Compositum.

EMPLASTRUM RESINÆ.

Plaster of Resin.

Emplastrum Adhæsivum, P.L. 1721.
Emplastrum Commune Adhæsivum, P.L. 1746.
Emplastrum Lithargyri cum Resina, P.L. 1788.
Emplastrum Resinæ, P.L. 1809, P.L. 1824.

Take of Resin half a pound,
Plaster of Lead three pounds;

To the Plaster of Lead, melted with a slow fire, add the Resin, powdered, and mix.

Pharmacopœia Preparation.—Emplastrum Belladonnæ.
Medicinal Uses.—Stimulant. Defensive.

EMPLASTRUM SAPONIS.

Plaster of Soap.

Emplastrum e Sapone, P.L. 1721, P.L. 1746.
Emplastrum Saponis, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Soap, sliced, half a pound,
Plaster of Lead three pounds;
Mix the Soap with the melted Plaster; then boil down to a proper consistence.

Medicinal Use.—Discutient.

ENEMATA.

ENEMAS.

ENEMA ALOËS.

Enema of Aloes.

Take of Aloes two scruples,
Carbonate of Potash fifteen grains,
Decoction of Barley half a pint;
Mix, and rub them together.

Medicinal Use.—It is employed for dislodging ascarides from the rectum, and likewise as a stimulant in constipation attendant upon amenorrhœa.

ENEMA COLOCYNTHIDIS.

Enema of Colocynth.

Take of Compound Extract of Colocynth two scruples,
Soft Soap an ounce,
Water a pint;
Mix, and rub them together.

Medicinal Use.—A very efficient enema in cases of obstinate constipation and colic.

ENEMA OPII.

Enema of Opium.

Take of Decoction of Starch four fluidounces,
Tincture of Opium thirty minims;
Mix.

Medicinal Use.—The bulk of the fluid is small for the obvious purpose of causing it to be retained for some time, so that it may act as an anodyne to irritable bowels.

ENEMA TABACI.

Enema of Tobacco.

Infusum Tabaci, P.L. 1809, P.L. 1824.

Take of Tobacco a drachm,
Water, boiling, a pint;
Macerate for an hour, and strain.

Remarks.—The active principle of tobacco is called *nicotina*, and its properties are stated to be as follows: it is liquid, colourless, with an acrid smell and taste; it does not become solid even at 20° Fahr. It mixes in all proportions with water, from which æther separates the greater part and dissolves it; it is soluble also in alcohol, oil of almonds, and, but very sparingly, in oil of turpentine. It may be slowly distilled at 284°, but at 474° it boils and decomposes. It combines with many acids to form salts, which are mostly soluble in water and in alcohol; the phosphate, oxalate and tartrate are crystallizable.

Nicotina dilates the pupils, and is so poisonous that a single drop is sufficient to kill a dog. It has not been analysed.

Medicinal Use.—This very drastic enema has been recommended in cases of hernia, but with doubtful success. The present preparation is weaker than that of the last Pharmacopœia in the proportion of four to five.

ENEMA TEREBINTHINÆ.

Enema of Turpentine.

Take of Oil of Turpentine a fluidounce,
Yelk of Egg as much as may be sufficient; rub them together and add
Decoction of Barley nineteen fluidounces;
Mix.

Medicinal Use.—Exployed in cases of intestinal worms, chiefly of tænia, and likewise in some spasmodic affections, as in chorea.

EXTRACTA.

EXTRACTS.

Extracts are those preparations which are obtained when vegetable substances are boiled in water, or have their soluble parts dissolved in proof spirit of wine, or when the expressed juices of recent plants are boiled down to a proper consistence for forming into pills; and in some cases, the evaporation is carried so far that the extract is reducible to powder.

As the medicinal power of some vegetable substances resides, to a certain extent, in principles which are insoluble in water, but dissolve in spirit of wine, different modes of operating are adopted; in the first case, that is, when the virtues of the medicines are completely soluble in water, such for example as those of gentian, the extract is termed a watery extract; when the vegetable contains resinous or other matter insoluble in water, it is extracted by spirit, and then termed a spirituous extract; while the juices of recent plants, when evaporated to a proper degree, were formerly called inspissated juices, but they are classed by the College with the extracts.

That part of vegetable bodies which is soluble in water, and reduced by evaporation to the state of extract, has, on this account, received the name of extractive matter, extract or extractive; it is evident, however, that extracts consist of all the various substances soluble in water, and they must therefore contain very different ingredients; for some are neutral, such as *colocyntin*, the peculiar principle of colocynth; but others contain vegetable salts; for example the extracts of cinchona contain *kinate of cinchonia* and *kinate of quina*, extract of opium contains *meconate of morphia*, &c., &c.; their medicinal powers existing generally, if not entirely, in the alkali.

In preparing Extracts, unless otherwise ordered, evaporate the water, by a water-bath, in a pan, as quickly as possible, towards the end, stirring constantly with a spatula, until a proper consistence is acquired for forming pills.

Sprinkle upon all softer extracts a little rectified Spirit, that they may not become mouldy.

EXTRACTUM ACONITI.

Extract of Aconite.

Extractum Aconiti, P.L. 1809, P.L. 1824.

Take of Aconite Leaves, fresh, a pound;

Bruise them, sprinkled with a little Water, in a stone mortar; then press out the juice, and evaporate it, unstrained, to a proper consistence.

Medicinal Uses.—Narcotic: in some cases diuretic. The dose should not at first exceed half a grain; but it may be gradually increased to gr. v. The medicinal power of Aconite resides in a peculiar alkali: see ACONITINA. This extract is of a brown colour; it has a disagreeable smell, and an acrid taste, and is not much employed.

EXTRACTUM ALOËS PURIFICATUM.

Purified Extract of Aloes.

Extractum Aloës, P.L. 1809.

Extractum Aloës Purificatum, P.L. 1809, edit. alt., P.L. 1824.

Take of Aloes, powdered, fifteen ounces,
Water, boiling, a gallon;

Macerate for three days with a gentle heat; afterwards strain, and set by that the dregs may subside. Pour off the clear liquor, and evaporate it to a proper consistence.

Remarks.—Aloes contains a bitter extractive substance which has been called *aloesin*, and this is the principal constituent; it is, however, probably a mixture or compound of various proximate principles. Besides this, a peculiar acid, called by Mr. Pereira *aloetic acid*, also appears to be present. The aqueous solution of aloes reddens litmus, becomes olive brown with solutions of iron, and does not precipitate gelatin. Considerable difference of opinion, however, exists as to the chemical nature of aloes. (Pereira, *Mat. Med.*, p. 645.)

Medicinal Uses.—Purgative. Stomachic. Dose, gr. v. to gr. xv.

EXTRACTUM BELLADONNÆ.

Extract of Deadly Nightshade.

Extractum Belladonnæ, P.L. 1809, P.L. 1824.

Take of Deadly Nightshade leaves, fresh, a pound; Bruise them, sprinkled with a little Water, in a stone mortar; then press out the juice, and evaporate it, unstrained, to a proper consistence.

Remarks.—This plant contains a peculiar alkali, called *Atropia*; the root furnishes about 3-1000dth of its weight. It is colourless, inodorous, crystallizes in silky transparent prisms, is soluble in about 1-500dth of its weight of cold water, and more so in hot water. The solution has a disagreeable bitter taste, and the alkaline property of restoring the blue colour of litmus reddened by an acid. The aqueous solution very readily and permanently dilates the pupil of the eye. It gives a white precipitate with infusion of galls, a lemon-yellow one with chloride of gold, and an Isabella yellow with chloride of platina. It is soluble in absolute alcohol and in æther.

Besides atropia there have been obtained from the nightshade *Atropic Acid*, *Belladonnina*, an alkali, and *Pseudotoxin*, a neutral vegetable product. (Pereira, *Mat. Med.*, p. 854.)

Atropia combines with acids to form definite salts; the sulphate and hydrochlorate are crystallizable. At a high temperature atropia is decomposed, and totally dissipated, yielding carbonate of ammonia and other products.

According to Liebig it is composed of

Twenty-three equivalents of Hydrogen	1 × 23 =	23	or	4·27
Sixty-eight equivalents of Carbon	6 × 68 =	408	,,	75·41
Twelve equivalents of Oxygen	8 × 12 =	96	,,	17·74
One equivalent of Azote.............		14	,,	2·58
Equivalent		541.		100·

Symbol,—Berzelius and Turner.... $H^{23}\ C^{68}\ O^{12}N$.

Brande .... $(23h + 68car + 12o + n)$.

Minute prismatic crystals have lately been observed in the Extractum Belladonnæ, which appeared to be very similar to, if not identical with, asparagin.

Pharmacopœia Preparations.—Emplastrum Belladonnæ.

Medicinal Uses.—Most useful as an external application to the eyebrows in ophthalmic surgery, to produce dilatation of the pupil.

EXTRACTUM CINCHONÆ CORDIFOLIÆ.

Extract of Heart-leaved Cinchona. [*Yellow Bark.*]

Take of Heart-leaved Cinchona, bruised, fifteen ounces,
Distilled Water four gallons;

Boil down in a gallon of the Water to six pints, and strain the liquor while hot. In like manner, boil down the bark in an equal measure of Water four times, and strain. Lastly, all the liquors being mixed together, evaporate to a proper consistence.

EXTRACTUM CINCHONÆ LANCIFOLIÆ.

Extract of Lance-leaved Cinchona. [*Pale Bark.*]

Extractum Corticis Peruviani, P.L. 1746, P.L. 1788.
Extractum Cinchonæ, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Lance-leaved Cinchona, bruised, fifteen ounces,
Distilled Water four gallons;

Boil down in a gallon of the Water to six pints, and strain the liquor while hot. In like manner, boil down the bark in an equal measure of Water four times, and strain. Lastly, all the liquors being mixed together, evaporate to a proper consistence.

EXTRACTUM CINCHONÆ OBLONGIFOLIÆ.

Extract of Oblong-leaved Cinchona. [*Red Bark.*]

Take of Oblong-leaved Cinchona, bruised, fifteen ounces,
Distilled Water four gallons;

Boil down in a gallon of the Water to six pints, and strain the liquor while hot. In like manner, boil down

the bark in an equal measure of Water four times, and strain. Lastly, all the liquors being mixed together, evaporate to a proper consistence.

Remarks.—The nature of the substances in which the medicinal power of the different varieties of cinchona reside, has been already mentioned. Extract of cinchona is of a dark brown colour, nearly inodorous and of a bitter taste. The active principles of cinchona are more soluble in spirit than in water; during ebullition, however, a considerable portion of superkinate of quina and superkinate of cinchonia is dissolved by the water, with a portion of inert soluble matter, and these together constitute extract of bark, which, since the discovery of quina, has been much less employed than before it.

Medicinal Uses.—Tonic. Stomachic. Dose, gr. x. to gr. xxx.

EXTRACTUM COLCHICI ACETICUM.

Acetic Extract of Meadow Saffron.

Take of the Meadow Saffron Cormus, fresh, a pound,
Acetic Acid three fluidounces;

Bruise the Cormus, sprinkled gradually with the Acetic Acid; then press out the juice, and evaporate it in an earthen vessel not glazed with lead, to a proper consistence.

Remarks.—The use of the acetic acid is to render the salt of colchicia, which the meadow saffron contains, more soluble.

Medicinal Uses.—It has been much employed in cases of acute rheumatism and gout, in dose of gr. j. to gr. ij. twice or thrice a day.

Dr. Paris (Appendix to Pharmacologia) states, that he has found this extract useful in promoting healthy discharges of bile, and has occasionally combined it with Pilulæ Hydrargyri, Hydrargyri Chloridum, and Antimonii Potassio-tartras.

EXTRACTUM COLCHICI CORMI.

Extract of Meadow Saffron Cormus.

Take of the Meadow Saffron Cormus, fresh, a pound; Bruise the Cormus, sprinkled with a little Water, in a stone mortar; then press out the juice, and evaporate it, unstrained, to a proper consistence.

Medicinal Uses.—Given in the dose of one grain every four hours, it has been found most efficient in several forms of acute rheumatism, particularly in its earliest stage, and is very generally used by Dr. Hue at St. Bartholomew's Hospital.

EXTRACTUM COLOCYNTHIDIS.

Extract of Colocynth.

Extractum Colocynthidis, P.L. 1809, P.L. 1824.

Take of Colocynth, cut in pieces, a pound,
Distilled Water two gallons;

Mix and boil with a slow fire for six hours, frequently adding distilled Water, that it may always fill the same measure. Strain the liquor while hot; lastly, evaporate it to a proper consistence.

Remarks.—This is a dark-coloured and extremely bitter extract. Colocynth contains a purgative principle to which the name of *colocyntin* has been given. It is obtained by digesting the colocynth in spirit, and evaporation. It is an extremely bitter, yellowish brown, translucent, brittle substance, dissolving more readily in alcohol than in water. The aqueous solution is precipitated by tincture of galls, and by protosulphate of iron, sulphate of copper, and nitrate of mercury, and it is readily dissolved by acids and by alkalis.

Medicinal Uses.—Extract of Colocynth is purgative. Dose, gr. v. to gr. xx.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM.

Compound Extract of Colocynth.

Extractum Catharticum, P.L. 1746.
Extractum Colocynthidis Compositum, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Colocynth, cut in pieces, six ounces,
Purified Extract of Aloes twelve ounces,
Scammony, powdered, four ounces,
Cardamom [husked], powdered, an ounce,
Soap three ounces,
Proof Spirit a gallon;

Macerate the Colocynth in the Spirit, with a gentle heat, for four days. Strain the Spirit, and add to it the Aloes, Scammony, and Soap; afterwards evaporate to a proper consistence, the Cardamom being mixed towards the end.

Pharmacopœia Preparation.—Enema Colocynthidis.

Medicinal Uses.—Cathartic. Dose, gr. v. to gr. xxx. It is esteemed to be particularly efficacious when combined with chloride of mercury in relieving habitual costiveness and obstinate visceral obstructions.

EXTRACTUM CONII.

Extract of Hemlock.

Succus Cicutæ Spissatus, P.L. 1788.
Extractum Conii, P.L. 1809, P.L. 1824.

Take of Hemlock Leaves, fresh, a pound;

Bruise them, sprinkled with a little Water, in a stone mortar; then press out the juice, and evaporate it, unstrained, to a proper consistence.

Remarks.—Conium contains the vegetable alkali *Conia*, combined with *Coniic acid*, according to Peschier; it differs from all

other vegetable alkalis hitherto discovered, except *nicotina*, in being both fluid and volatile. It has the appearance of a colourless volatile oil, is lighter than water, and of a very powerful, diffusible, repulsive odour, somewhat like that of the hemlock itself: it is intensely acrid to the taste. It has a strong alkaline reaction on turmeric and reddened litmus: combines readily with and neutralizes acids, and some of the salts which it forms with them have been obtained in a crystalline state. It is sparingly soluble in water, but imparts its odour and taste to it. With about one-fourth of its weight of water, it forms a hydrate; by exposure to the air it quickly becomes of a dark colour, and spontaneously decomposes with the evolution of ammonia. Its boiling point is 370°; it distils however with boiling water, and is partially decomposed during the operation.

According to Dr. Christison, few poisons equal conia in subtilty or swiftness. A single drop put into the eye of a rabbit killed it in nine minutes; three drops used in the same way, killed a strong cat in a minute and a half; two grains neutralized with hydrochloric acid, and injected into the femoral vein of a young dog, killed it in about three seconds.

Composition.—According to Liebig's experiments, it appears to consist of very nearly

Fourteen equivalents of Hydrogen ..	$1 \times 14 = 14$	or	12·96
Twelve equivalents of Carbon......	$6 \times 12 = 72$	,,	66·67
One equivalent of Oxygen	8	,,	7·41
One equivalent of Azote	14	,,	12·96
Equivalent	108.		100·

Symbol,—Berzelius and Turner.. $H^{14}\,C^{12}\,O\,N$.

Brande .... $(14h + 12car + o + n)$.

Pharmacopœia Preparations.—Cataplasma Conii, Pilulæ Conii Compositæ.

Medicinal Uses.—Anodyne. In doses of five grains every eight hours, and gradually increased to the same quantity every four hours, or until headache or sense of constriction across the forehead supervene: it has been successfully employed in cases of acute rheumatism in its more advanced stages. It is likewise of service in the hooping-cough.

EXTRACTUM DIGITALIS.

Extract of Foxglove.

Take of Foxglove Leaves, fresh, a pound;

Bruise them, sprinkled with a little water, in a stone

mortar; then press out the juice, and evaporate it, unstrained, to a proper consistence.

Remarks.—The active principle of this plant has been called *digitalia*; its properties have, however, been but imperfectly examined. When the solution obtained in acetic æther is evaporated, the digitalia remains in the state of an orange-coloured, bitter mass, which is hard when cold, but becomes soft on being heated. It attracts moisture from the air, is very soluble in water and in alcohol, though but little in sulphuric æther. The aqueous solution is precipitated by diacetate of lead and infusion of galls. It has been supposed to be an alkali, but its properties have not been clearly determined. It is said to crystallize under favourable circumstances; but it has also been asserted that the crystals obtained were merely nitrate of potash.

Its composition is unknown.

Medicinal Uses.—The exhibition of foxglove in this form requires great caution; for the virtues of the extract must vary with its mode of preparation, the quality of the leaf as affected by the season, and the degree of concentration of the extract itself.

EXTRACTUM ELATERII.

Extract of Elaterium.

Elaterium, P.L. 1721, P.L. 1746, P.L. 1788.
Extractum Elaterii, P.L. 1809, P.L. 1824.

Slice ripe wild Cucumbers, and strain the juice, very gently expressed, through a very fine hair sieve; then set it by for some hours, until the thicker part has subsided. The thinner supernatant part being rejected, dry the thicker part with a gentle heat.

Remarks.—This extract has a greenish colour; its taste is bitter and rather acrid; and when tolerably pure, it is light, pulverulent and inflammable. Mr. Hennell informs me, that if the juice be too long exposed it is apt to undergo fermentation, which should not be suffered to take place. The extract must be dried on blotting paper. Its properties have been particularly examined by Dr. Paris, and according to his experiments, they reside in a

peculiar substance, which he has called *elatin*, and of which the extract contains only about 10 per cent.—Pharmacologia, vol. ii. p. 241, 5th edit.

The extract of Elaterium has also been examined by Mr. Hennell. He separated from it, by the action of alcohol, minute colourless crystals, which were nearly insoluble in water or dilute acids, and sparingly dissolved by æther. They did not form neutral compounds with acids, fused between 300° and 400°, and burnt in the flame of a spirit-lamp, giving off much charcoal. The spirituous solution did not precipitate the salts of iron, silver, or lead. Whether these crystals possessed medicinal power was not determined. Mr. Hennell is inclined to the opinion that they were crystallized bitter principle.

By analysis these crystals yielded

Hydrogen	23·9	nearly	24	equivalents	24
Carbon	36·9	„	6	„	36
Oxygen	39·2	„	5	„	40
	100·				100.

The portion undissolved by the alcohol was treated with æther, which dissolved a green extract that had the properties of a resin, and possessed in a concentrated form, all the medicinal properties of elaterium. Twenty minims of a solution of $3\frac{1}{2}$ grains in an ounce of alcohol acted powerfully.

The residue insoluble in alcohol and æther, yielded starch to hot water, and the remainder lost woody fibre by burning, and left earthy matter.

Extractum Elaterii yielded by analysis very nearly

Elatin (green resinous extract) ..	17
Bitter principle?	44
Starch	6
Woody fibre	27
Earthy matter	7
	101.

Medicinal Uses.—Hydragogue. Cathartic. Dose, from half a grain to two grains.

EXTRACTUM GENTIANÆ.

Extract of Gentian.

Extractum Gentianæ, P.L. 1746, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Gentian, sliced, two pounds and a half,
Distilled Water, boiling, two gallons;

Macerate for twenty-four hours; then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence.

Remarks.—Extract of Gentian is of a dark colour, has but little smell, and possesses a strong though not a disagreeable bitter taste. It is tonic and stomachic, though seldom employed alone, but chiefly as a vehicle for, or adjunct to, certain mineral tonics, as the preparations of iron or zinc. Good Gentian is stated by Mr. Brande to yield half its weight of extract. Dose gr. x. to gr. xxx. twice or three times a day.

Gentian Root appears to contain several different substances: 1st. A volatile odorous principle, owing to which it is stated that the distilled water has a strong smell and a sharp taste, and produces nausea and a kind of intoxication. 2nd. *Gentisin* or *Gentisic Acid*: this is procured by washing the spirituous extract of the root with water, and then treating it with alcohol; by evaporating this solution and treating the residue with æther, etc., gentisic acid is obtained in pale yellow needle-form crystals, which have a weak but peculiar smell, and no taste. It is nearly insoluble in water, but dissolved by alcohol. It may be vaporized without decomposition, and unites with alkalis to form salts. It produces no effect on the solution of acetate of lead or nitrate of silver; but chloride of iron and the salts of copper produce characteristic changes in the alcoholic solution. 3rd. *Gentianite*, the bitter principle of gentian, has not been obtained in a separate state. It is procured by digesting the spirituous extract of gentian in water, and after separating the acid, a liquid is obtained, which by evaporation yields a sweet and a very bitter extract, from which æther separates wax, resin, and fatty matter, but not the sugar. 4th. *Pectin*, or *Pectic Acid*, is the substance to which the gelatinization of infusion of gentian is owing, whenever it occurs. 5th. *Sugar*. To the presence of this may be

ascribed the vinous fermentation which the infusion of gentian is capable of undergoing, and by which an alcoholic liquor (*gentian spirit*) is obtained. (Pereira, *Elements of Mat. Med.*, p. 895.)

EXTRACTUM GLYCYRRHIZÆ.

Extract of Liquorice.

Extractum Glycyrrhizæ, P.L. 1746, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Liquorice, sliced, two pounds and a half,
Distilled Water, boiling, two gallons;

Macerate for twenty-four hours; then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence.

Remarks.—This is a well-known extract, of a dark colour and sweet taste. It is usually imported from Italy, and when it has had a fresh form given to it, it is employed under the name of *refined liquorice* as a demulcent in tickling coughs.

Liquorice contains a peculiar sugar, which is called *glycyrrhizin*; it is a yellow transparent substance, which is extremely sweet, readily dissolves in water and alcohol, and combines also with acids and alkalis, and occasions precipitates in most metallic salts.

Pharmacopœia Preparations.—Decoctum Aloes Compositum, Tinctura Aloes.

EXTRACTUM HÆMATOXYLI.

Extract of Logwood.

Extractum Ligni Campechensis, P.L. 1746, P.L. 1788.
Extractum Hæmatoxyli, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Logwood, powdered, two pounds and a half,
Distilled Water, boiling, two gallons;

Macerate for twenty-four hours; then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence.

Remarks.—This extract is of a deep red colour, and has a sweetish astringent taste. It becomes very hard by keeping, so that pills made of it pass through the body unchanged.

Logwood contains a peculiar colouring principle called *hematin*; it separates from the aqueous solution in small reddish crystals, which have a bitter astringent taste; the aqueous solution is of a fine red colour when boiling hot, and becomes yellow on cooling. It unites with metallic oxides; alkalis render it first purple, then violet, and eventually brown, apparently by decomposition.

Medicinal Use.—Astringent in protracted diarrhœa and dysentery. Dose, gr. x. to gr. xxx. in some aromatic distilled water.

EXTRACTUM HYOSCYAMI.

Extract of Henbane.

Extractum Hyoscyami, P.L. 1809, P.L. 1824.

Take of Henbane Leaves, fresh, a pound;

Bruise them, sprinkled with a little Water, in a stone mortar; then press out the juice, and evaporate it, unstrained, to a proper consistence.

Remarks.—This extract contains a large proportion of *hyoscyama*, the active and alkaline principle of henbane, which crystallizes in stellated colourless prisms, of a silky lustre. They are inodorous; their taste is disagreeable and bitter. Water dissolves hyoscyama sparingly, but it is very soluble in alcohol and in æther; it gives an abundant white precipitate with tincture of galls, a yellowish white one with chloride of gold, but none with that of platina. When moist it exhibits alkaline properties, and also by neutralizing acids and forming crystalline salts with some of them; these as well as the alkali itself are very poisonous. It has not been analysed, but when strongly heated it is decomposed, and like the other vegetable alkalis, among other products yields ammonia, and consequently contains azote.

Medicinal Uses.—This extract is an excellent anodyne and antispasmodic, and possesses the advantage of not materially confining the bowels. Dose, gr. v. to gr. x. twice or thrice a day.

EXTRACTUM JALAPÆ.

Extract of Jalap.

Extractum Jalapii, P.L. 1746, P.L. 1788.
Extractum Jalapæ, P.L. 1809, P.L. 1824.

Take of Jalap, powdered, two pounds and a half,
Rectified Spirit a gallon,
Distilled Water two gallons;

Macerate the Jalap Root in the Spirit for four days, and pour off the Tincture. Boil down the residue in the Water to half a gallon; afterwards strain the tincture and the decoction separately, and let the latter be evaporated, and the former distil, until each thickens. Lastly, mix the Extract with the Resin, and evaporate to a proper consistence.

This Extract should be kept *soft,* which may be fit to form pills, and *hard,* which may be rubbed to powder.

Medicinal Use.—Purgative. Dose, gr. x. to gr. xx. This extract is nearly inodorous, has a brown colour and a bitter taste. Jalap appears to contain a peculiar principle called *jalapin*; it is a transparent colourless resin, very soluble in alcohol, but insoluble in æther; it constitutes nearly nine-tenths of jalap resin. *Jalapic acid* is another principle contained in this root, and constitutes about thirteen one-hundredths of jalap resin. It is brown, acrid, bitterish, slightly soluble in æther, and more soluble in alkalis than jalapin.

Pharmacopœia Preparation.—Pulvis Scammonii Compositus.

EXTRACTUM LACTUCÆ.

Extract of Lettuce.

Extractum Lactucæ, P.L. 1824.

Take of Lettuce Leaves, fresh, a pound;

Bruise them, sprinkled with a little Water, in a stone mortar; then press out the juice, and evaporate it, unstrained, to a proper consistence.

Remarks.—The virtues of the Lettuce are stated to reside in a peculiar principle termed *lactucin,* and which, according to Buchner's analysis, constitutes about 18 per cent. of the preparation of lettuce termed *lactucarium* by Dr. Duncan. It is bitter, of a saffron-yellow colour, nearly inodorous; dissolves readily in alcohol, less so in æther, and sparingly in water. The solution in dilute spirit is precipitated by infusion of galls. The supposition once entertained, that the Extract of Lettuce contains morphia, has been proved to be unfounded.

Medicinal Uses.—This preparation is much esteemed by some practitioners as a mild opiate and narcotic. Dose, gr. v. to gr. x, twice or thrice a day.

EXTRACTUM LUPULI.

Extract of Hop.

Extractum Humuli, P.L. 1809, P.L. 1824.

Take of Hops half a pound,

Distilled Water, boiling, two gallons;

Macerate for twenty-four hours; then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence.

Remarks.—This is a dark-coloured bitter extract, totally devoid of the aromatic principle of the hop. The virtues of the hop are supposed to reside in a peculiar neutral bitter principle to which the name of *lupulin* has been given.

Medicinal Use.—Sedative. Dose, gr. v. to gr. xx.

EXTRACTUM OPII PURIFICATUM.

Purified Extract of Opium.

Opium Colatum vel *Extractum Thebaicum*, P.L. 1721, P.L. 1746.
Opium Purificatum, P.L. 1788.
Extractum Opii, P.L. 1809, P.L. 1824.

Take of Opium, sliced, twenty ounces,
Distilled Water a gallon;

Add a little Water to the Opium, and macerate for twelve hours, that it may soften; then, the rest of the Water being poured in gradually, rub them until they are very well mixed, and set by that the dregs may subside; afterwards strain the liquor, and evaporate to a proper consistence.

Properties.—Although the cold infusion of opium possesses the peculiar smell of the drug, yet it is dissipated during evaporation, so that the extract is nearly inodorous. It is of a brown colour, and has a bitter taste. The residue may in many cases be advantageously treated with more water.

Pharmacopœia Preparation.—Vinum Opii.

Medicinal Use.—The form of extract is to be preferred to that of tincture, when it is intended to continue the operation of the medicine, and not to obtain its full effects at once; but in cases of accident, or in which the effects of opium are to be called into immediate action, the tincture should be employed. Dose, gr. j. to gr. v. for an adult.

EXTRACTUM PAPAVERIS.

Extract of Poppy.

Extractum Papaveris Albi, P.L. 1788, edit. alt.
Extractum Papaveris, P.L. 1809, P.L. 1824.

Take of Poppy [Capsules], bruised, the seeds being taken out, fifteen ounces,
Distilled Water, boiling, a gallon;
Macerate for twenty-four hours; then boil down to four pints, and strain the liquor while hot; lastly, evaporate to a proper consistence.

Medicinal Uses.—Anodyne. Narcotic. Dose, from gr. ij. to gr. xx. given in the form of pills. This extract is said to be less apt than opium to occasion nausea, headache, and delirium, and therefore to be preferred for procuring sleep in diseases in which the head is much affected.

EXTRACTUM PAREIRÆ.

Extract of Pareira.

Take of Pareira, bruised, two pounds and a half,
Distilled Water, boiling, two gallons;
Macerate for twenty-four hours; then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence.

Medicinal Uses.—Diuretic. Dose, gr. x. to gr. xxx. with demulcents, occasionally combined with opium, hyoscyamus, &c., in *catarrhus vesicæ* and irritation of the bladder.

Wiggers has announced the discovery of a new vegetable alkali in this root, which he calls *cissampelina*; it is represented by him as a strong saline base, soluble in æther and acetic acid, and precipitable from the latter by carbonate of soda. (Pereira, *Mat. Med.*, p. 1329.)

EXTRACTUM RHEI.

Extract of Rhubarb.

Extractum Rhei, P.L. 1809, P.L. 1824.

Take of Rhubarb, powdered, fifteen ounces,
Proof Spirit a pint,
Distilled Water seven pints;

Macerate for four days with a gentle heat, afterwards strain, and set by, that the dregs may subside. Pour off the liquor, and evaporate it, when strained, to a proper consistence.

Remarks.—The medicinal power of Rhubarb has been supposed to reside in a peculiar principle called *rhabarberic acid,* of which, according to Brandes, Chinese rhubarb contains nearly ten per cent. mixed with 25 per cent. of woody fibre, and twelve or thirteen different substances, acids and salts; chemists are not however agreed on this subject; the virtues of Rhubarb are said to be much diminished during the process of extraction.

Medicinal Use.—Purgative. Dose, from gr. x. to gr. xxx. in the form of pills, or dissolved in an aromatic water.

EXTRACTUM SARZÆ.

Extract of Sarsaparilla.

Extractum Sarsaparillæ, P.L. 1809, P.L. 1824.

Take of Sarsaparilla, sliced, two pounds and a half,
Distilled Water, boiling, two gallons;

Macerate for twenty-four hours; then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence.

Remark.—The peculiar principle of Sarsaparilla has been already noticed. See Decoctum Sarzæ.

Medicinal Use.—Alterative. Dose, gr. xx. to ʒj. given in pills, or dissolved in the decoction. Even among those who admit the efficacy of other preparations of Sarsaparilla, there is great difference of opinion respecting the activity of this extract.

EXTRACTUM STRAMONII.

Extract of Thornapple.

Extractum Stramonii, P.L. 1824.

Take of Thornapple Seeds fifteen ounces,
Distilled Water, boiling, a gallon;

Macerate for four hours, in a vessel lightly covered, near the fire; afterwards take out the Seeds, and bruise them in a stone mortar: return them when bruised to the liquor. Then boil down to four pints, and strain the liquor while hot. Lastly, evaporate to a proper consistence.

Medicinal Use.—Narcotic. Dose, gr. $\frac{3}{4}$ to gr. ij. daily, in maniacal and asthmatic affections.

Remarks.—According to Brandes the seeds of thornapple contain less than two per cent. of *malate of daturia*, a vegetable alkali described by Geiger and Hesse, as crystallizing in colourless, inodorous, brilliant prisms, which have at first a bitterish, then a tobacco-like flavour. It requires 280 parts of cold or 72 parts of boiling water to dissolve it; in alcohol it is very soluble, less so in æther. In most of its properties it agrees with hyoscyama; it strongly dilates the pupils, and has a poisonous action on animals.

EXTRACTUM TARAXACI.

Extract of Dandelion.

Extractum Taraxaci, P.L. 1809, P.L. 1824.

Take of Dandelion Root, fresh, bruised, two pounds and a half,
Distilled Water, boiling, two gallons;

Macerate for twenty-four hours; then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence.

Remarks.—According to John, the juice of this root contains caoutchouc, bitter matter, traces of resin, sugar, and gum, free acid, phosphates, sulphates and the chlorides of potassium and calcium; and the root contains 12 per cent. of inulin. Mr. Squire states that the expressed juice contains gum, albumen, gluten, an odorous principle, extractive, and a bitter principle, soluble in alcohol and water.

Medicinal Uses.—Aperient. Deobstruent. Dose, gr. x. to gr. ʒj. in obstructions of the liver and in visceral disease.

EXTRACTUM UVÆ URSI.

Extract of Whortleberry.

Take of Whortleberry, bruised, two pounds and a half,
Distilled Water, boiling, two gallons;

Macerate for twenty-four hours; then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence.

Medicinal Use.—See Decoctum Uvæ Ursi.

INFUSA.

INFUSIONS.

Infusions are mere solutions of vegetable matter in water, which is sometimes used cold, but in the London Pharmacopœia it is in every instance directed to be boiling; in this state it is poured upon the substance, the active principles of which are intended to be dissolved. The aromatic, bitter, astringent, and mucilaginous properties of vegetable products are, to a considerable extent, soluble in water, while the saline ingredients are but imperfectly, and the resinous portions are totally unacted upon by it.

The substances infused should be only coarsely powdered, or cut into thin slices; for if they are employed in the state of fine powder, not only is the proper action prevented by the proximity of their particles, but the infusion is with difficulty rendered clear.

Hard water should, as much as possible, be avoided, for it not only acts less powerfully as a solvent, but the precipitation which takes place by boiling renders it extremely turbid, and increases the difficulty of procuring a clear infusion. The infusions prepared with cold water are weaker than those in which hot water is employed, unless the digestion be continued for a much longer time.

Dried vegetables are stated to yield their virtues by infusion more readily than when they are in a recent state.

If infusions be long kept, and especially in hot weather, they become turbid, deposit the matter which they had dissolved, and undergo decomposition; they ought, therefore, never to be kept for use longer than a few hours, but prepared for the occasion upon which they are prescribed.

INFUSUM ANTHEMIDIS.

Infusion of Chamomile.

Infusum Anthemidis, P.L. 1809, P.L. 1824.

Take of Chamomile five drachms,
Distilled Water, boiling, a pint;

Macerate for ten minutes, in a vessel lightly covered, and strain.

Remarks.—Chamomile flowers have not been analysed; their most important constituents are volatile oil, bitter extractive and tannic acid.

Medicinal Use.—Stomachic, in dyspepsia; and the infusion prepared with cold water, is said to be more grateful than that made with hot. Dose, f℥i. to f℥ij.

It is employed warm for promoting the operation of emetics.

Incompatibles.—Solutions of the salts of iron, mercury, silver and lead.

INFUSUM ARMORACIÆ COMPOSITUM.

Compound Infusion of Horseradish.

Infusum Armoraciæ Compositum, P.L. 1809, P.L. 1824.

Take of Horseradish, sliced,
Mustard, bruised, each an ounce,
Compound Spirit of Horseradish a fluidounce,
Distilled Water, boiling, a pint;

Macerate the Root and the Seeds in the Water for two hours, in a vessel lightly covered, and strain; then add the compound Spirit of Horseradish.

Medicinal Use.—Stimulant in paralysis. Dose, f℥i. to f℥iss.

Incompatibles.—Solutions of the salts of silver and mercury, and of the alkaline carbonates.

INFUSUM AURANTII COMPOSITUM.

Compound Infusion of Orange [Peel].

Infusum Aurantii Compositum, P.L. 1809, P.L. 1824.

Take of Orange Peel, dried, half an ounce,
Lemon Peel, fresh, two drachms,
Cloves, bruised, one drachm,
Distilled Water, boiling, a pint;

Macerate for a quarter of an hour, in a vessel lightly covered, and strain.

Medicinal Use.—Stomachic. Dose, f℥i. to f℥ij.

INFUSUM CALUMBÆ.

Infusion of Calumba.

Infusum Calumbæ, P.L. 1809, P.L. 1824.

Take of Calumba, sliced, five drachms,
Distilled Water, boiling, a pint;

Macerate for two hours, in a vessel lightly covered, and strain.

Medicinal Uses.—Tonic and stomachic. Dose, f℥jss. to f℥ij. It very soon spoils; it contains no astringent matter.

Incompatibles.—Solutions of the acetates of lead, bichloride of mercury and lime-water.

INFUSUM CARYOPHYLLI.

Infusion of Clove.

Infusum Caryophylli, P.L. 1809.
Infusum Caryophyllorum, P.L. 1809, edit. alt., P.L. 1824.

Take of Cloves, bruised, three drachms,
Distilled Water, boiling, a pint;

Macerate for two hours, in a vessel lightly covered, and strain.

Medicinal Uses.—Stimulant and stomachic. Dose, f℥i. to f℥ij. It is generally exhibited in combination with other medicines.

Incompatibles.—Lime-water, solutions of the salts of iron, zinc, lead, silver and antimony.

INFUSUM CASCARILLÆ.

Infusion of Cascarilla.

Infusum Cascarillæ, P.L. 1809, P.L. 1824.

Take of Cascarilla, bruised, an ounce and a half,
Distilled Water, boiling, a pint;

Macerate for two hours, in a vessel lightly covered, and strain.

Remarks.—According to Brandes cascarilla contains a peculiar alkaline substance, which he has named *cascarillina.*

Medicinal Uses.—Tonic and stomachic. Dose, f℥jss. to f℥ij.

Incompatibles similar to those enumerated under the last infusion.

INFUSUM CATECHU COMPOSITUM.

Compound Infusion of Catechu.

Infusum Catechu, P.L. 1809.

Infusum Catechu Compositum, P.L. 1809, edit. alt., P.L. 1824.

Take of Extract of Catechu, powdered, six drachms,
Cinnamon, bruised, a drachm,
Distilled Water, boiling, a pint;

Macerate for an hour, in a vessel lightly covered, and strain.

Medicinal Use.—Astringent in diarrhœa. Dose, f℥i. to f℥iij. every four hours.

INFUSUM CINCHONÆ.

Infusion of Cinchona.

Infusum Cinchonæ, P.L. 1809, P.L. 1824.

Take of Lance-leaved Cinchona [*Pale Bark*], bruised, an ounce,
Distilled Water, boiling, a pint;

Macerate for six hours, in a vessel lightly covered, and strain.

Medicinal Uses.—Tonic in dyspepsia, &c. Dose, f℥i. to f℥iij. three or four times a day.

INFUSUM CUSPARIÆ.

Infusion of Cusparia.

Infusum Cuspariæ, P.L. 1809, P.L. 1824.

Take of Cusparia, bruised, five drachms,
Distilled Water, boiling, a pint;
Macerate for two hours, in a vessel lightly covered, and strain.

Medicinal Uses.—Tonic and stimulant in dyspepsia. Dose, f℥jss. to f℥ij.

It is stated by Saladin that the virtue of Cusparia resides in a peculiar neutral substance which he calls *cusparin.* It is said to crystallize in tetrahedrons; cold water dissolves 1–200dth, and boiling water 1–100dth of its weight. It dissolves in concentrated acids and in the alkalis, and is precipitated by infusion of galls.

According to Fischer, Cusparia contains nearly 4 per cent. of a peculiar bitter principle.

Incompatibles.—The solutions of the salts of most metals, and tincture of galls.

INFUSUM DIGITALIS.

Infusion of Foxglove.

Infusum Digitalis, P.L. 1809, P.L. 1824.

Take of Foxglove Leaves, dried, a drachm,
Spirit of Cinnamon a fluidounce,
Distilled Water, boiling, a pint;
Macerate the Foxglove Leaves in the Water for four hours, in a vessel lightly covered, and strain; then add the Spirit.

Medicinal Use.—Diuretic. Dose, f℥ss. to f℥j. twice a day.

Incompatibles.—It is decomposed by solutions of the salts of iron, and probably by those of most other metals. It is weaker than the former infusion in the proportion of nearly 1 to 2½. This change, Dr. Paris observes, the practitioner must regard as judicious when its activity is considered.

INFUSUM DIOSMÆ.

Infusion of Buchu.

Take of Buchu an ounce,
Distilled Water, boiling, a pint;
Macerate for four hours, in a vessel lightly covered, and strain.

Remarks.—According to Brandes buchu contains nearly 4 per cent. of bitter extractive matter, which he calls *diosmin*, mixed with many salts and other vegetable products.

Medicinal Uses.—Diuretic, tonic and sudorific.

The infusion, Dr. Paris observes, has been employed in diarrhœa, and in the decline of dysentery, but it is principally valued in chronic inflammation of the bladder, and retention of urine. Dose, f℥iss. to f℥ij.

INFUSUM GENTIANÆ COMPOSITUM.

Compound Infusion of Gentian.

Infusum Amarum Simplex, P.L. 1721, P.L. 1746.
Infusum Gentianæ Compositum, P.L. 1809, P.L. 1824.

Take of Gentian, sliced,
Orange Peel, dried, each two drachms,
Lemon Peel, fresh, four drachms,
Distilled Water, boiling, a pint;
Macerate for an hour, in a vessel lightly covered, and strain.

Incompatibles.—Solution of diacetate of lead, sulphate of iron, and analogous salts.

Pharmacopœia Preparation.—Mistura Gentianæ Composita.

Medicinal Uses.—Stomachic and tonic. Dose, f℥jss. to f℥ii.

INFUSUM KRAMERIÆ.

Infusion of Rhatany.

Take of Rhatany an ounce,
Distilled Water, boiling, a pint;
Macerate for four hours, in a vessel lightly covered, and strain.

Medicinal Uses.—Tonic and astringent. Dose, f℥iss. to f℥ij. It contains a large quantity of tannin or tannic acid, and is incompatible with metallic salts, with the stronger acids, lime-water, &c.

INFUSUM LINI COMPOSITUM.

Compound Infusion of Linseed.

Infusum Lini, P.L. 1809.
Infusum Lini Compositum, P.L. 1824.

Take of Linseed, bruised, six drachms,
Liquorice, sliced, two drachms,
Distilled Water, boiling, a pint;
Macerate for four hours, near the fire, in a vessel lightly covered, and strain.

Medicinal Uses.—Demulcent in dysuria and catarrh.
Incompatibles.—Preparations of lead and iron, and probably most metallic salts.

INFUSUM LUPULI.

Infusion of Hop.

Take of Hops six drachms,
Distilled Water, boiling, a pint;
Macerate for four hours, in a vessel lightly covered, and strain.

Medicinal Uses.—Tonic, stomachic and slightly narcotic. Dose, f℥j. to f℥iss.

INFUSUM PAREIRÆ.

Infusion of Pareira.

Take of Pareira six drachms,
Distilled Water, boiling, a pint;
Macerate for two hours, in a vessel lightly covered, and strain.

Medicinal Uses.—Employed in cases of irritation of the bladder and *catarrhus vesicæ.* Dose, f℥j. to f℥iss. twice or thrice a day. The activity of the infusion may be increased by the addition of the extract.

INFUSUM QUASSIÆ.

Infusion of Quassia.

Infusum Quassiæ, P.L. 1809, P.L. 1824.

Take of Quassia, sliced, two scruples,
Distilled Water, boiling, a pint;
Macerate for two hours, in a vessel lightly covered, and strain.

Remarks.—The medicinal power of quassia appears to exist in a peculiar neutral substance called *quassin*. It is colourless, crystallizes in very small prisms, is very slightly soluble in water, 100 parts taking up but 0·45 part of it; æther also dissolves it sparingly: its best solvent is hot and strong alcohol. The aqueous solution of quassia is precipitated white by tannic acid, but is not altered by chlorine or by iodine. All the solutions of quassin are colourless; it is perfectly neutral, and though soluble in sulphuric acid and in nitric acid, it does not combine with them. It is stated to be composed of

Hydrogen	6·827
Carbon	66·912
Oxygen	26·261
	100·

Medicinal Uses.—Stomachic and tonic. Dose, f℥jss. to f℥ij.

Incompatibles.—There are few substances which produce any effect upon this solution; even the preparations of iron cause no change in it.

INFUSUM RHEI.

Infusion of Rhubarb.

Infusum Rhei, P.L. 1809, P.L. 1824.

Take of Rhubarb, sliced, three drachms,
Distilled Water, boiling, a pint;

Macerate for two hours, in a vessel lightly covered, and strain.

Medicinal Uses.—Stomachic and tonic. Dose, f℥j. to f℥iij.

Incompatibles.—The stronger acids, metallic solutions, some astringent infusions. The alkalis darken the colour of this infusion, but do not decompose it.

INFUSUM ROSÆ COMPOSITUM.

Compound Infusion of Rose.

Tinctura Rosarum Rubrarum, P.L. 1721.
Tinctura Rosarum, P.L. 1746.
Infusum Rosæ, P.L. 1788, P.L. 1809.
Infusum Rosæ Compositum, P.L. 1824.

Take of Red Rose [Petals], dried, three drachms,
Diluted Sulphuric Acid a fluidrachm and a half,
Sugar six drachms,
Distilled Water, boiling, a pint;

Pour the Water upon the Rose Petals in a glass vessel; then mix in the acid. Macerate for six hours, and strain the liquor; lastly, add the Sugar to it.

Medicinal Uses.—Astringent and refrigerant. Dose, f℥j. to f℥jss. or more.

Incompatibles.—Alkalis and earths, and all substances which combine with sulphuric acid, or are acted upon even by small quantities of it; acetate of lead of course throws down a copious precipitate. Sulphate of iron gives it a brown colour, but no precipitate is formed for some hours. It is much employed as a vehicle for the exhibition of cathartic salts.

INFUSUM SCOPARII.

Infusion of Broom.

Take of Broom [the fresh Tops] an ounce,
Distilled Water, boiling, a pint;

Macerate for four hours, in a vessel lightly covered, and strain.

Medicinal Uses.—Aperient. Diuretic. It has been used in dropsy, and it is said with success. Dose, f℥i. to f℥ij.

INFUSUM SENNÆ COMPOSITUM.

Compound Infusion of Senna.

Infusum Senæ, P.L. 1721.
Infusum Senæ Commune, P.L. 1746.
Infusum Sennæ Simplex, P.L. 1788.
Infusum Sennæ, P.L. 1809.
Infusum Sennæ Compositum, P.L. 1824.

Take of Senna fifteen drachms,
Ginger, sliced, four scruples,
Distilled Water, boiling, a pint;
Macerate for an hour, in a vessel lightly covered, and strain.

Remarks.—This infusion spoils quickly; when exposed to the air a yellow precipitate is formed in it, and its purgative qualities are lost.
Incompatibles.—Strong acids, lime-water, and most metallic salts.
Pharmacopœia Preparation.—Mistura Gentianæ Composita.
Medicinal Use.—Purgative. Dose, f℥iij. to f℥iv.

INFUSUM SERPENTARIÆ.

Infusion of Serpentary.

Take of Serpentary half an ounce,
Distilled Water, boiling, a pint;
Macerate for four hours, in a vessel lightly covered, and strain.

Medicinal Uses.—Diaphoretic. Tonic. Dose, f℥j. to f℥ij. two or three times a day.

INFUSUM SIMARUBÆ.

Infusion of Simaruba.

Infusum Simaroubæ, P.L. 1809, P.L. 1824.

Take of Simaruba, bruised, three drachms,
Distilled Water, boiling, a pint;
Macerate for two hours, in a vessel lightly covered, and strain.

Remarks.—According to the analysis of Morin, Simaruba contains quassin, traces of gallic acid, malic acid, malate and oxalate of lime, &c. Pfaff states that one-fourth part of this bark consists of mucilage.

Medicinal Uses.—Tonic, in the latter stages of dysentery. Dose, f℥ij.

Incompatibles.—Lime-water, alkaline carbonates; many metallic salts, especially those of lead, silver and mercury.

INFUSUM VALERIANÆ.

Infusion of Valerian.

Take of Valerian half an ounce,
Distilled Water, boiling, a pint;
Macerate for half an hour, in a vessel lightly covered, and strain.

Remarks.—This root, when subjected to distillation with water, yields an oil, which, as well as the water rising and condensed with it, contains valerianic acid, probably formed by the oxidizement of the oil.

The oil of valerian is pale green, or yellowish and limpid; its smell and taste resemble those of camphor, and it is bitter but not acrid. Its specific gravity is 0·934. Valerianic acid is liquid

at $-6°$ Fahr., boils at 270°, is soluble in 30 parts of water, and mixes with alcohol and æther in all proportions; its neutral salts are all soluble. According to Ettling it consists of

Nine equivalents of Hydrogen ..	$1 \times 9 = 9$	or 9·7
Ten equivalents of Carbon......	$6 \times 10 = 60$	„ 64·5
Three equivalents of Oxygen....	$8 \times 3 = 24$	„ 25·8
Equivalent	93.	100·

Medicinal Use.—Antispasmodic. Dose, f℥iss. to f℥ij. two or three times a day.

LINIMENTA.

LINIMENTS.

LINIMENTUM ÆRUGINIS.

Liniment of Verdigris.

Unguentum Ægyptiacum, P.L. 1721.
Mel Ægyptiacum, P.L. 1746.
Oxymel Æruginis, P.L. 1788.
Linimentum Æruginis, P.L. 1809, P.L. 1824.

Take of Verdigris, powdered, an ounce,
Vinegar seven fluidounces,
Honey [despumated] fourteen ounces;

Dissolve the Verdigris in the Vinegar, and strain through a linen cloth; afterwards, the Honey being poured in, boil down to a proper consistence.

Medicinal Use.—Detergent and escharotic.

LINIMENTUM AMMONIÆ.

Liniment of Ammonia.

Linimentum Ammoniæ Fortius, P.L. 1788,
P.L. 1809, P.L. 1824.

Take of Solution of Ammonia a fluidounce,
Olive Oil two fluidounces;
Shake them together until they are mixed.

LINIMENTUM AMMONIÆ SESQUI-CARBONATIS.

Liniment of Sesquicarbonate of Ammonia.

Linimentum Volatile, P.L. 1746.
Linimentum Ammoniæ, P.L. 1788.
Linimentum Ammoniæ Carbonatis, P.L. 1809.
Linimentum Ammoniæ Subcarbonatis, P.L. 1809, edit. alt., P.L. 1824.

Take of Solution of Sesquicarbonate of Ammonia a fluidounce,
Olive Oil three fluidounces;
Shake them together until they are mixed.

Remarks.—In the first of these preparations the union between the ammonia and oil is most perfect, on account of the carbonic acid combined with the ammonia of the last; but in both cases a kind of fluid soap is formed.

Medicinal Use.—They are employed as stimulants in cynanche tonsillaris, spread on flannel, and applied round the throat.

LINIMENTUM CAMPHORÆ.

Liniment of Camphor.

Linimentum Camphoræ, P.L. 1809, P.L. 1824.

Take of Camphor an ounce,
Olive Oil four fluidounces;
Dissolve the Camphor in the Oil.

Medicinal Use.—This is employed as a stimulant embrocation to sprains and bruises, and in rheumatism.

LINIMENTUM CAMPHORÆ COMPOSITUM.

Compound Liniment of Camphor.

Linimentum Camphoræ, P.L. 1788.
Linimentum Camphoræ Compositum, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Camphor two ounces and a half,
Solution of Ammonia seven fluidounces and a half,
Spirit of Lavender a pint;
Mix the Solution of Ammonia with the Spirit; then let a pint distil from a glass retort, with a slow fire; lastly, in this dissolve the Camphor.

Medicinal Use.—This is used for the same purposes as the former, and is much more powerful on account of the ammonia which it contains.

LINIMENTUM HYDRARGYRI COMPOSITUM.

Compound Liniment of Mercury.

Linimentum Hydrargyri, P.L. 1809, P.L. 1824.

Take of Stronger Ointment of Mercury,
Lard, each four ounces,
Camphor an ounce,
Rectified Spirit a fluidrachm,
Solution of Ammonia four fluidounces;
Rub the Camphor, first with the Spirit, then with the Lard and Ointment of Mercury; lastly, the Solution of Ammonia being gradually poured in, mix them all.

Medicinal Uses.—This liniment is stimulant and discutient. One drachm, containing nearly ten grains of mercury, may be rubbed on the affected part night and morning. It is said to salivate sooner than mercurial ointment, when freely employed.

LINIMENTUM OPII.

Liniment of Opium.

Take of Liniment of Soap six fluidounces,
Tincture of Opium two fluidounces;
Mix.

Medicinal Use.—This is a useful sedative liniment.

LINIMENTUM SAPONIS.

Liniment of Soap.

Linimentum Saponaceum, P.L. 1746.
Linimentum Saponis, P.L. 1788.
Linimentum Saponis Compositum, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Soap three ounces,
Camphor an ounce,
Spirit of Rosemary sixteen fluidounces;
Dissolve the Camphor in the Spirit; afterwards add the Soap, and macerate with a gentle heat until it is dissolved.

Medicinal Use.—This is a stimulant application; it is less powerful than the Linimentum Camphoræ Compositum, but is used for similar purposes.

Pharmacopœia Preparation.—Linimentum Opii.

LINIMENTUM TEREBINTHINÆ.

Liniment of Turpentine.

Linimentum Terebinthinæ, P.L. 1809, P.L. 1824.

Take of Soft Soap two ounces,
Camphor an ounce,
Oil of Turpentine sixteen fluidounces;
Shake them together until they are mixed.

Medicinal Use.—This is a more powerful stimulant application than the preceding.

MELLITA.

PREPARATIONS OF HONEY.

MEL BORACIS.

Honey of Borax.

Mel Boracis, P.L. 1809, P.L. 1824.

Take of Borax, powdered, a drachm,
Honey [despumated] an ounce;
Mix.

Medicinal Uses.—Detergent and cooling in aphthous affections of the tongue and fauces.

MEL ROSÆ.

Honey of Rose.

Mel Rosatum, P.L. 1721.
Mel Rosaceum, P.L. 1746.
Mel Rosæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Red Rose [Petals] dried, four ounces,
Water, boiling, two pints and a half,
Honey [despumated] five pounds;
Macerate the Rose Petals in the Water for six hours; then add the Honey to the strained liquor, and boil down, in a water-bath, to a proper consistence.

Medicinal Use.—As an adjunct to detergent and astringent gargles.

OXYMEL.

Oxymel.

Oxymel Simplex, P.L. 1721, P.L. 1746, P.L. 1788.
Mel Acetatum, P.L. 1788, edit. alt.
Oxymel, P.L. 1809.
Oxymel Simplex, P.L. 1809, edit. alt., P.L. 1824.

Take of Honey [despumated] ten pounds,
Acetic Acid a pint and a half;
Mix the Acid with the Honey made hot.

Medicinal Use.—Detergent; principally used as the basis of gargles and expectorant remedies. Dose, f℥j. to f℥ss.

OXYMEL SCILLÆ.

Oxymel of Squill.

Oxymel Scilliticum, P.L. 1721, P.L. 1746.
Oxymel Scillæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Honey [despumated] three pounds,
Vinegar of Squill a pint and a half;
Boil down in a glass vessel, with a slow fire, to a proper consistence.

Medicinal Use.—Expectorant. Dose, f℥ss. to f℥ij. in chronic coughs. In large doses it is emetic.

METALLICA.

METALLIC PREPARATIONS.

PRÆPARATA EX ALUMINIO.

PREPARATIONS OF ALUMINIUM.

ALUMEN EXSICCATUM.

Dried Alum.

Alumen Ustum, P.L. 1721, P.L. 1746, P.L. 1788.
Alumen Exsiccatum, P.L. 1809, P.L. 1824.

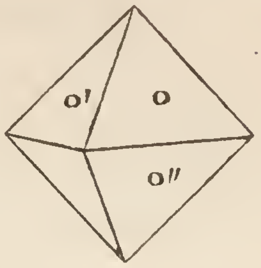
Let Alum melt in an earthen vessel over the fire; then let the fire be increased, until the ebullition has ceased.

Remarks.—Aluminium is a metal obtained from alumina, pure clay, or the earth of alum, but with considerable difficulty; it is of a grey colour, generally in small scales or spangles of a metallic lustre; alumina is the only known oxide of this metal; it is by Berzelius considered as a sesquioxide, and by Dr. Thomson as a protoxide composed of 1 equivalent of oxygen 8, and 1 equivalent of aluminium 10, the number of alumina being consequently 18.

Symbol,—Berzelius and Turner .... AlO.
Brande .... AL.

Alum is a well-known double salt; the primary form is a cube, but it usually crystallizes in regular octahedrons, which are often very large:

$$\left.\begin{array}{c} O \text{ on } O' \\ \text{or} \\ O \text{ on } O'' \end{array}\right\} 109^\circ\ 28'\ 16''$$



Alum is styptic and astringent; it effloresces slightly by exposure to the air; dissolves in 18 times its weight of water at 60°, and in $\frac{3}{4}$ths of its weight at 212°. The solution reddens litmus paper.

There are three kinds of alum known to chemists, viz., potash alum, soda alum, and ammonia alum; their crystalline form is the same. Potash alum is the common alum; the others contain each an equivalent of the sulphate of soda or ammonia, instead of sulphate of potash.

Composition.—Considered as a double salt, alum, according to Dr. Thomson, consists of

One eq. of Sulphate of Potash....		88	or	18·07
Three eqs. of Sulphate of Alumina	$58 \times 3 =$	174	„	35·73
Twenty-five equivalents of Water	$9 \times 25 =$	225	„	46·20
		487.		100·

Symbol,—Berzelius and Turner $KO, SO^3; 3(AlO, SO^3;) 25HO$.
Brande .... $3(\text{Al} + S') + (P + S') + 25q$.

Process.—When alum is moderately heated as directed, it fuses in its water of crystallization, and when this is expelled it becomes spongy and opaque; if the heat be too strong, then a portion of sulphuric acid is driven off with the water.

Impurities and Tests.—See Notes: Alumen.

Incompatibles.—Alkalis and their carbonates; lime and lime-water, magnesia and its carbonate, tartrate of potash, acetates of lead, &c.

Pharmacopœia Preparations.—Alumen Exsiccatum. Liquor Aluminis Compositus.

Medicinal Uses.—Alum is internally a powerful astringent in hæmorrhages and inordinate fluxes, and is externally useful in repellent astringent lotions and collyria. Dose, gr. x. to gr. xx.

LIQUOR ALUMINIS COMPOSITUS.

Compound Solution of Alum.

Aqua Aluminosa Bateana, P.L. 1746.
Aqua Aluminis Composita, P.L. 1788.
Liquor Aluminis Compositus, P.L. 1809, P.L. 1824.

Take of Alum,
Sulphate of Zinc, each an ounce,
Boiling Water, three pints;
Dissolve the Alum and Sulphate of Zinc together in the water; afterwards strain.

Medicinal Uses.—This solution is powerfully astringent, and is successfully used as a detergent lotion to old ulcers, as a collyrium and as an injection; it will also often remove chilblains, and relieve slight excoriations.

PRÆPARATA EX ANTIMONIO.

PREPARATIONS OF ANTIMONY.

ANTIMONII OXYSULPHURETUM.

Oxysulphuret of Antimony.

Sulphur Antimonii Præcipitatum, P.L. 1746, P.L. 1788.
Antimonii Sulphuretum Præcipitatum, P.L. 1809, P.L. 1824.

Take of Sesquisulphuret of Antimony, powdered, seven ounces,
Solution of Potash four pints,
Distilled Water two gallons,
Diluted Sulphuric Acid as much as may be sufficient;

Mix the Sesquisulphuret of Antimony, Solution of Potash and Water together, and boil with a slow fire for two hours, frequently stirring, distilled Water being often added, that it may fill about the same measure. Strain the liquor, and gradually pour into it as much diluted Sulphuric Acid as may be sufficient to precipitate the Oxysulphuret of Antimony; then, with water, wash away the Sulphate of Potash, and dry what remains with a gentle heat.

Remarks.—Antimony is a white brilliant metal, it is brittle, and its specific gravity is about 6·7; it is often called *regulus of Antimony*, to distinguish it from what is termed *crude Antimony*, which is the sesquisulphuret of the Pharmacopœia. Sesquisulphuret of antimony is the most abundant ore of the metal; it is a brittle grey substance, which has usually a striated crystalline appearance and metallic lustre. It is composed of

One and a half equivalent of Sulphur	24	or 27
One equivalent of Antimony	65	,, 73
Equivalent......	89.	100.

Symbol,—Berzelius and Turner...... Sb $S^{1\frac{1}{2}}$.
Brande .... $(an + 1\frac{1}{2}s)$.

Properties.—This preparation is of a bright orange colour, owing to the water with which the sesquisulphuret of antimony combines when precipitated from solution in potash. Its taste is slightly styptic. It is insoluble in water, and the greater portion is not readily acted upon by dilute acids; but when boiled in a solution of bitartrate of potash I found that it dissolved about 12 per cent. of the oxysulphuret, which is the amount of sesquioxide that it contained.

Process and Composition.—It is generally admitted by chemists that the composition of this substance is uncertain. My analysis gives very nearly

Sesquioxide of Antimony........	12·
Sesquisulphuret of Antimony	76·5
Water	11·5
	100·

During the formation of a compound of these proportions, we may suppose the following changes to occur: when six eqs. of sesquisulphuret of antimony are dissolved in a solution of pot-

ash, five of the eqs. are dissolved by it, apparently without being decomposed ; one eq. of sesquisulphuret seems, on the contrary, to be decomposed by one and a half eq. of potash, the results being one and a half eq. of sulphuret of potassium, and one eq. of sesquioxide of antimony ; the solution of potash, therefore, contains one and a half eq. of sulphuret of potassium, one eq. of sesquioxide of antimony, and five eqs. of sesquisulphuret of antimony.

When the diluted sulphuric acid is added to this mixture, it forms sulphate with the potash, and it occasions the decomposition of one and a half eq. of water, and of the one and a half eq. of sulphuret of potassium; the hydrogen of the water and sulphur of the sulphuret combine to form hydrosulphuric acid which is expelled in the state of gas, while the oxygen of the water, and the potassium of the sulphuret, form oxide of potassium or potash, which also combines with sulphuric acid to form sulphate. By the action of the sulphuric acid, there are therefore formed hydrosulphuric acid gas, which is evolved, sulphate of potash, which is washed away, and there are precipitated in combination,

One eq. of Sesquioxide of Antimony......		77	or 13
Five eqs. of Sesquisulphuret of Antimony..	$89 \times 5 =$	445	„ 75
Eight eqs. of Water	$9 \times 8 =$	72	„ 12
		594·	100.

This is the nearest approach to the composition above stated.

Impurities and Tests.—See Notes : ANTIMONII OXYSULPHURETUM.

Pharmacopœia Preparation.—Pilulæ Hydrargyri Chloridi Compositæ.

Medicinal Uses.—It is but seldom employed, except in the above-named preparation, being, on account of its variable composition, less certain in its operation than other antimonials.

Dose.—In herpetic and other eruptions, from gr. j. to gr. iv. twice a day. In larger doses it is emetic.

ANTIMONII POTASSIO-TARTRAS.

Potassio-tartrate of Antimony.

Tartarus Emeticus, P.L. 1721.
Tartarum Emeticum, P.L. 1746.
Antimonium Tartarizatum, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Sesquisulphuret of Antimony, rubbed to powder,
Nitrate of Potash, powdered, each two pounds,
Bitartrate of Potash, powdered, fourteen ounces,
Hydrochloric Acid four fluidounces,
Distilled Water a gallon;

Accurately mix the Sesquisulphuret of Antimony with the Nitrate of Potash; the Hydrochloric Acid being then added, and the powder spread upon an iron plate, ignite it. Rub what remains to very fine powder, when it is cold, and wash it frequently with boiling water until it is free from taste. Mix the powder thus prepared with the Bitartrate of Potash, and boil for half an hour in a gallon of distilled water. Strain the liquor while hot, and set it aside that crystals may be formed. These being removed and dried, let the liquor again evaporate that it may yield crystals.

Remarks.—In the last Pharmacopœia *glass of antimony* was used in preparing this medicine; it is, however, not only difficult to obtain it, but glass of lead is frequently substituted for, and, what is still worse, mixed with it. By the present formula an oxysulphuret of antimony is obtained similar in composition to the *crocus antimonii* of the Pharmacopœia of 1788; in that preparation, however, the mixture was fused, which rendered the sesquioxide less easily soluble in the bitartrate of potash than that obtained by the present process.

Process.—When nitrate of potash is mixed and ignited with sulphuret of antimony, rapid combustion ensues; both are decomposed; a portion of the sulphur of the sulphuret combines with part of the oxygen of the decomposed nitric acid, and the result is sulphuric acid, which forms sulphate of potash, with the potash of the decomposed nitrate; another portion of the oxygen unites with the antimony of the decomposed sulphuret, and sesquioxide of antimony is formed which remains mixed with sulphate of potash, and some sulphuret of antimony; and there would also be free potash and sulphuret of potassium, were it not for the hydrochloric acid employed, which saturates the alkali, and either prevents the formation of the sulphuret or immediately decomposes it when formed. When the residue of the combustion is washed, as directed, sulphate of potash and chloride of potassium are removed by it, and a mixture of sesquioxide and sulphuret of antimony remains, to which perhaps the name of oxysulphuret may be given, as well as to the last preparation, though it is not certain that either of them is a definite compound.

Sesquioxide of Antimony, the base of this preparation, is composed of

One and a half equivalent of Oxygen	12	or	15·58
One equivalent of Antimony	65	„	84·42
Equivalent......	77·		100·

Symbol,—Berzelius and Turner.... $Sb\,O^{1\frac{1}{2}}$.
Brande .... $(an + 1\frac{1}{2}o)$.

Bitartrate of Potash is a salt containing two equivalents of tartaric acid and one equivalent of potash; when it is boiled in water with the oxysulphuret of antimony, the equivalent of acid in excess combines with two equivalents of sesquioxide of antimony, and the sulphuret remains unacted upon; the solution therefore consists of two equivalents of tartaric acid, one equivalent of potash, and two equivalents of sesquioxide of antimony, and these combining, crystallize together as a double salt, or potassio-tartrate of antimony.

Antimonii Potassio-tartras, or
Tartrate of Potash and Ditartrate of Antimony.

Bitartrate of Potash.	2 eqs. Tartaric Acid. 1 eq. Potash.	2 eqs. Sesquioxide of Antimony.	Oxysulphuret of Antimony.
		Sulphuret of Antimony.	

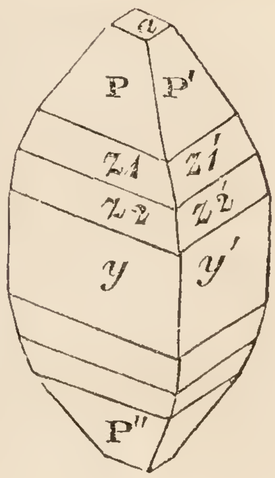
Composition.—Antimonii Potassio-tartras is a compound of

One equivalent of Tartrate of Potash........	$66 + 48 = 114$
One equivalent of Ditartrate of Antimony....	$66 + 154 = 220$
Three equivalents of Water.................	$9 \times 3 = 27$
Equivalent......	361.

Symbol,
—Berzelius & Turner $KO, H^2 C^4 O^5; 2 SbO^{1\frac{1}{2}}, H^2 C^4 O^5; 3 HO.$
Brande.......... $(2an + 1\frac{1}{2}o) + (2tar' + P) + 3q.$

Or it contains

Two equivalents of Tartaric Acid....	$66 \times 2 = 132$	or	36·6
One equivalent of Potash	48	„	13·3
Two eqs. of Sesquioxide of Antimony	$77 \times 2 = 154$	„	42·6
Three equivalents of Water	$9 \times 3 = 27$	„	7·5
Equivalent....	361.		100·



Properties.—Potassio-tartrate of antimony crystallizes with great facility, and the general character of the crystals of this compound is that of an *octahedron with a rhombic base.* One distinct cleavage only has been obtained, which is parallel to the plane *a* of the accompanying figure. The planes *z* and *y* are generally striated.

The following are the nearest to coinciding measurements taken on several crytals:

P on P'	108°	16'
P over the edge on the left ..	104	15
P on z^1	166	40
P on z^2	165	40 nearly.
a on P, or P'	122	00
a on *y*....................	90	00

The crystals of this salt are colourless and inodorous, but have a styptic metallic taste: on exposure to the air, they effloresce slightly and become opaque. When strongly heated this salt is decomposed, and an alloy of antimony and potassium is obtained. It is soluble in about fifteen times its weight of water at 60°, and twice its weight at 212°. The aqueous solution decomposes spontaneously after it has been some time prepared. It is insoluble in alcohol.

Impurities and Tests.—See Notes: ANTIMONII POTASSIO-TARTRAS.

Adulteration.—This salt should never be purchased in powder,

but always in crystals: in the former state it frequently contains a portion of bitartrate of potash uncombined with any oxide of antimony, and which in preparing the vinum antimonii potassio-tartratis, remains undissolved. To judge if the crystals have been properly prepared, drop one or two into a solution of hydro-sulphuric acid, and an orange-coloured deposit ought to be formed on them.

Mr. Hennell informs me, that this salt may contain 10 per cent. of bitartrate of potash, and yet the whole will dissolve in the quantity of water required for the solution of the potassio-tartrate of antimony. In order to detect any uncombined bitartrate, he adds a few drops of a solution of carbonate of soda to a boiling solution of the antimonial salt, and if the precipitate formed be not redissolved, he concludes that there is no bitartrate of potash present.

Incompatibles.—The solution of potassio-tartrate of antimony is decomposed by acids, by alkalis and their carbonates, by some of the earths and metals, and their oxides, by lime-water, chloride of calcium, and the acetates of lead. Many vegetable infusions, and especially those which are bitter and astringent, decompose it, such as cinchona, rhubarb, catechu, &c.

Pharmacopœia Preparations.—Unguentum Antimonii Potassio-tartratis, Vinum Antimonii Potassio-tartratis.

Medicinal Uses.—Potassio-tartrate of antimony either sweats, vomits, or purges, according to the quantity exhibited. A *quarter of a grain*, if the skin be kept warm, will promote a diaphoresis; *half a grain* will first prove purgative, and then diaphoretic; and *one grain* will generally vomit, then purge, and lastly sweat the patient. It may be given in solution.

VINUM ANTIMONII POTASSIO-TARTRATIS.

Wine of Potassio-tartrate of Antimony.

Vinum Antimonii Tartarisati, P.L. 1788.
Liquor Antimonii Tartarizati, P.L. 1809.
Vinum Antimonii Tartarizati, P.L. 1824.

Take of Potassio-tartrate of Antimony two scruples,
Sherry Wine a pint;
Dissolve the Potassio-tartrate of Antimony in the Wine.

Process.—The College have restored the use of wine in this preparation. When the antimonial salt has been carelessly prepared, and contains bitartrate of potash uncombined with oxide of antimony, a deposit is apt to be formed in this solution; those practitioners therefore who purchase the potassio-tartrate should insist on having it in the state of crystals, in which there is but little chance of the occurrence of this imperfection. If any deposit be observed in this preparation, it ought to be rejected; each fluidounce contains two grains of the potassio-tartrate.

Incompatibles.—See ANTIMONII POTASSIO-TARTRAS.

Medicinal Uses.—In doses of ♏xv. to f℥j. it acts as a diaphoretic when given with saline medicines, warm drinks, &c.

PULVIS ANTIMONII COMPOSITUS.

Compound Powder of Antimony.

Pulvis Antimonialis, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Sesquisulphuret of Antimony, powdered, a pound,
Horn shavings, two pounds;

Mix and throw them into a crucible red hot in the fire, and stir constantly until vapour no longer arises. Rub that which remains to powder, and put it into a proper crucible. Then apply fire, and increase it gradually that it may be red hot for two hours. Rub the residue to very fine powder.

Process.—Sesquisulphuret of Antimony, as already mentioned, consists of sulphur and antimony; horn is composed of phosphate of lime mixed with gelatinous animal matter. When the sulphuret and horn are heated together, the sulphur is expelled in vapour; and the antimony, combining with the oxygen of the air, is converted into antimonious acid. The gelatinous animal matter is dissipated by the heat, but the phosphate of lime suffers no change; there remains, therefore, in the crucible, a mixture of antimonious acid, consisting of two equivalents of oxygen 16, and 1 equivalent of antimony 65=81, and phosphate of lime, forming Pulvis Antimonii Compositus.

Properties.—This preparation is an inodorous insipid powder, of a dull white colour. It is insoluble in water, and only partially soluble in acids; if, however, the antimony it contains were in the state of sesquioxide, as has been stated, then hydrochloric acid, when heated, would entirely dissolve it.

Composition.—In consequence of Dr. Elliotson's statement, that he had exhibited upwards of 100 grains of this medicine without producing any effect, I procured specimens of it from two respectable sources, and subjected them to analysis. I found one of them to consist of

Antimonious Acid	35
Phosphate of Lime	65
	100

The other yielded

Antimonious Acid	38
Phosphate of Lime	62
	100

I have also analysed James's powder, of which the Pulvis Antimonii Compositus is an imitation, and found it to consist nearly of

Antimonious Acid	56
Phosphate of Lime	44
	100

These proportions agree almost exactly with the results obtained by Dr. Pearson; and the high state of oxidizement of the antimony will fully account for the inactivity of both preparations.

According to Berzelius and Dr. Maclagan, these preparations contain a little antimonite of lime, the base of which appears to be derived from the decomposition of the carbonate contained in the horn or in the bone substituted for it. This, as well as some superphosphate of lime which Dr. Maclagan states to exist in these compounds, is soluble in water.

Adulteration.—No doubt can be entertained that this preparation, like every other, has been sophisticated; but owing to want of power in the genuine article, the practitioner probably has not been disappointed by its adulteration.

Medicinal Uses.—It is stated to be diaphoretic, alterative, emetic, or purgative, according to the extent of the dose and the state of the patient. The doses mentioned are from gr. v. to gr. x. It is worth the consideration of the practitioner, whether the employment of this preparation may not be altogether superseded by that of potassio-tartrate of antimony.

PRÆPARATA EX ARGENTO.

PREPARATIONS OF SILVER.

ARGENTI NITRAS.

Nitrate of Silver.

Causticum Lunare, P.L. 1721, P.L. 1746.
Argentum Nitratum, P.L. 1788.
Argenti Nitras, P.L. 1809, P.L. 1824.

Take of Silver an ounce and a half,
Nitric Acid a fluidounce,
Distilled Water two fluidounces;

Mix the Nitric Acid with the Water, and dissolve the Silver in them in a sand-bath. Afterwards increase the heat gradually, that the Nitrate of Silver may be dried. Melt this in a crucible, with a slow fire, until, the Water being expelled, ebullition has ceased; then immediately pour it into proper moulds.

Process.—Nitric Acid is composed of oxygen and azote, and when silver is dissolved in it, a portion of the acid is partially decomposed into nitric oxide gas and oxygen; the former escapes into the atmosphere, and separating a portion of its oxygen from admixture with the azotic gas, red nitrous acid gas is formed by their union. The oxygen of the decomposed acid unites with the silver to form oxide of silver, composed of 1 equivalent of oxygen $8+1$ equivalent of silver $108=116$, and

this is dissolved by the nitric acid undecomposed, and converted into nitrate of silver.

Nitrous Acid Gas.

Nitric Acid. { Nitric Oxide *Gas.* — Oxygen Gas. } Atmospheric Air.

{ Oxygen. — Azotic Gas. }

Silver.

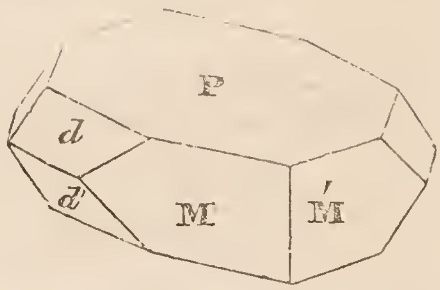
$\underbrace{\text{Oxygen. Silver.}}$ *Oxide of Silver.*

Nitric Acid.

$\underbrace{\text{Oxide of Silver. Nitric Acid.}}$ *Nitrate of Silver.*

Properties.—Solution of Nitrate of Silver readily yields transparent colourless anhydrous crystals, the primary form of which is *a right rhombic prism.*

P on *d*............	116° 36′
M on *d*............	148 0
M on M′..........	129 31
d on *d*′..........	126 48



In some crystals the planes *d* are barely visible, while in others those planes encroach so much on M and M′ as to leave only minute portions of them discernible.

Water, at the temperature of 60°, dissolves its own weight of this salt. It is not deliquescent. By exposure to a strong light it becomes blackish, and especially if in contact with carbonaceous matter; this is owing to the reduction of a part of the silver to the metallic state. When moderately heated it readily melts, swells, and then remains liquid. On cooling it forms a whitish mass, having a striated and crystalline structure. If subjected to a red heat it is decomposed; care is therefore to be taken that the ebullition be not carried on too long, but merely to dissipate any water that may have remained after the application of the gentler heat first employed. It stains the skin black.

Composition.—Nitrate of Silver is composed of

One equivalent of Nitric Acid....	54	or 31·76
One equivalent of Oxide of Silver	116	„ 68·24
Equivalent....	170.	100·

Symbol,—Berzelius and Turner.. $Ag\,O, NO^5$.

Brande .... $(\mathrm{Ag}+n')$.

Incompatibles.—Almost all spring and river water, on account of the common salt which they usually contain; chlorides; the alkalis, potash, soda and their carbonates; lime-water. Ammonia added in excess redissolves the precipitate at first formed; the sesquicarbonate throws down carbonate of silver. The sulphuric, hydrochloric and tartaric acids, and the salts which contain them, decompose nitrate of silver. It is decomposed by hydrosulphuric acid and its salts, by the soluble sulphurets and astringent vegetable infusions.

Pharmacopœia Preparation.—Liquor Argenti Nitratis.

Pharmacopœia Use.—Argenti Cyanidum.

Medicinal Uses.—It is the most manageable and powerful of all escharotics. Internally it is tonic and antispasmodic, and has been especially exhibited in cases of epilepsy; when it has been long taken it is sometimes deposited in the rete mucosum, so as to give a permanent dark purple hue to the patient. Dose, *one eighth of a grain* gradually increased to *one grain.* But very much larger doses have been given. It should be made into pills with crumb of bread, and mixed with a little sugar to prevent the mass from becoming too hard.

LIQUOR ARGENTI NITRATIS.

Solution of Nitrate of Silver.

Take of Nitrate of Silver a drachm,
Distilled Water a fluidounce;

Dissolve the Nitrate of Silver in the Water, and strain; then, the access of light being prevented, keep it in a well-closed vessel.

Remarks.—This is employed in many cases to determine the presence of chlorides, hydrochloric acid and hydrochlorates, with which it gives a white precipitate of chloride of silver insoluble in acids or in solution of potash or soda, but readily dissolved by ammonia, and precipitated from it by saturation with an acid.

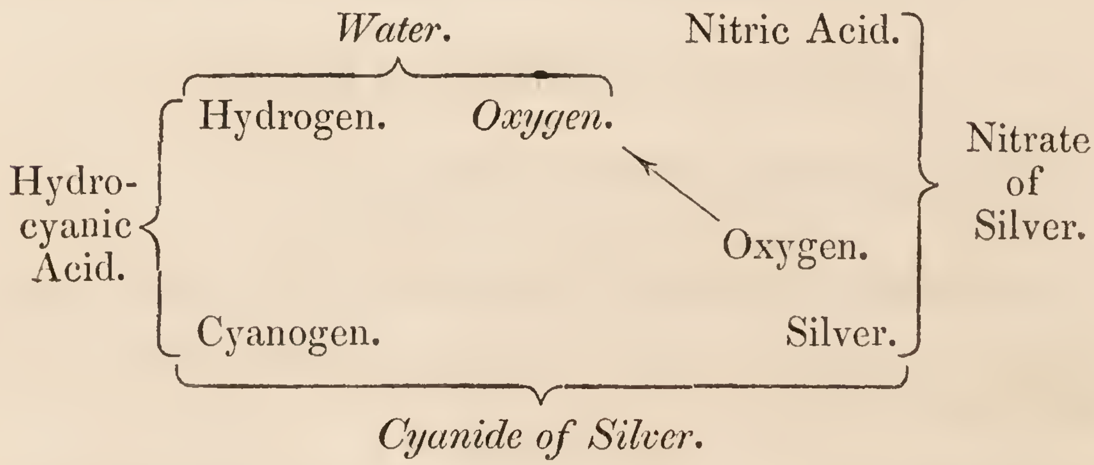
ARGENTI CYANIDUM.

Cyanide of Silver.

Take of Nitrate of Silver two ounces and two drachms,
Diluted Hydrocyanic Acid,
Distilled Water, each a pint;

Dissolve the Nitrate of Silver in the Water, and add to them the diluted Hydrocyanic Acid, and mix. Wash what is precipitated with distilled Water, and dry it.

Process.—The nature and composition of hydrocyanic acid and nitrate of silver have already been stated. When solutions of them are mixed as directed, the cyanogen of the hydrocyanic acid combines with the silver of the oxide to form cyanide of silver, which is precipitated, and the hydrogen of the acid unites with the oxygen of the oxide to form water, which remains in solution with the nitric acid of the nitrate of silver.



Properties.—Cyanide of Silver is precipitated in the form of a white powder. It is insoluble in water, and dissolves in sulphuric and nitric acids only when they are concentrated and very hot. Hydrochloric acid, hydrosulphuric acid and the hydrosulphates decompose it readily. The alkalis, potash and soda do not dissolve it, but it is easily soluble in ammonia. It is decomposed by a red heat, and gives, when it has been well dried, silver and cyanogen gas; but when it contains water, it yields hydrocyanic acid and cyanogen, and leaves silver mixed with charcoal.

Composition.—This Cyanide is composed of

One equivalent of Cyanogen	26	or	19·4
One equivalent of Silver..........	108	,,	80·6
Equivalent....	134.		100·

Symbol,—Berzelius and Turner...... Ag Cy.
Brande .... $(ag+cy)$.

Impurities and Tests.—See Notes: ARGENTI CYANIDUM.

Incompatibles.—Sulphuric and nitric acids when concentrated and hot. Hydrochloric acid, hydrosulphuric acid and hydrosulphates, and ammonia.

Pharmacopœia Use.—Acidum Hydrocyanicum Dilutum.

PRÆPARATUM EX ARSENICO.

PREPARATION OF ARSENIC.

LIQUOR POTASSÆ ARSENITIS.

Solution of Arsenite of Potash.

Liquor Arsenicalis, P.L. 1809, P.L. 1824.

Take of Arsenious Acid, broken into small pieces,
Carbonate of Potash, each eighty grains,
Compound Tincture of Lavender five fluidrachms,
Distilled Water a pint;

Boil the Arsenious Acid and Carbonate of Potash with half a pint of the Water in a glass vessel until they are dissolved. Add the Compound Tincture of Lavender to the cooled liquor. Lastly, add besides, of distilled

Water, as much as may be sufficient, that it may accurately fill a pint measure.

Remarks.—Arsenic is a grey brittle metal, which when fresh broken has considerable lustre. Its specific gravity is 5·884. It combines with two different quantities of oxygen, forming *Arsenious Acid*, entering into the composition of the Liquor Potassæ Arsenitis of the London Pharmacopœia, and *Arsenic Acid*, not employed in it.

Arsenious Acid is composed of

One and a half equivalent of Oxygen..	12	or	24
One equivalent of Arsenic	38	,,	76
Equivalent....	50.		100.

Symbol,—Berzelius and Turner.... As $O^{1\frac{1}{2}}$.
Brande .... $(ar + 1\frac{1}{2}o)$.

Arsenic Acid consists of

Two and a half equivalents of Oxygen	20	or	34·4
One equivalent of Arsenic	38	,,	65·6
Equivalent......	58.		100·

Symbol,—Berzelius and Turner .... As $O^{2\frac{1}{2}}$.
Brande................ $(ar + 2\frac{1}{2}o)$.

Properties of Arsenious Acid.—It occurs in large colourless pieces, which externally are usually opaque; but internally, when recently broken, they are frequently transparent, and have the appearance of glass, which is colourless or yellowish. This substance, called also *white arsenic*, and *oxide of arsenic*, is moderately hard and brittle; it is inodorous, has hardly any taste, and is extremely poisonous. Its specific gravity, when transparent, I find to be 3·715, and when opaque 3·620; the opacity I believe to be owing to the absorption of water from the atmosphere. Arsenious acid is volatilized at the temperature of about 380°, and when thus vaporized it is inodorous, although usually stated to possess an alliaceous smell, which belongs only to volatilized metallic arsenic. A thousand parts of water at a mean temperature are said to dissolve 9·6 parts of transparent, and 12·5 of opaque arsenious acid in 36 hours; the same quantity of boiling water dissolves 97 parts of the transparent kind, of which 18 are retained on cooling and 79 deposited in the state of small crystals, the form of which is the regular octahedron. The subject

of the solubility of arsenious acid in water has been lately examined by Mr. Taylor (Guy's Hospital Reports). He does not find any difference in the solubility of the transparent and opaque varieties; his experiments are, however, I think not quite conclusive in some respects. The solution of arsenious acid reddens litmus paper slightly, and it combines with the alkalis, potash and soda, with great facility, forming compounds which are called *arsenites.*

Arsenic Acid is prepared by subjecting arsenic, or, which is preferable, arsenious acid, to the action of nitric acid; by the oxygen which the nitric acid yields during decomposition, the arsenic is perfectly acidified and converted into *arsenic acid,* which is readily soluble in water, and much more powerfully acid than the arsenious acid. Its compounds are called *arseniates.*

Process.—Liquor Potassæ Arsenitis is very readily prepared; a few minutes' ebullition of the ingredients in a Florence flask is sufficient to dissolve the arsenious acid; during solution carbonic acid gas is evolved, owing to the greater affinity existing between the arsenious acid and potash, than between carbonic acid and potash.

$$\left.\begin{array}{r}\text{Carbonic Acid } \textit{Gas}. \\ \\ \underbrace{\text{Arsenious Acid.} \qquad\qquad \text{Potash.}}_{\textit{Arsenite of Potash.}}\end{array}\right\} \begin{array}{l}\text{Carbonate} \\ \text{of Potash.}\end{array}$$

The arsenious acid usually sold in powder should not be employed for this preparation; it is very commonly adulterated with sulphate of lime or gypsum, which being insoluble in the solution of carbonate of potash, the operator supposes that it is difficult to prepare this medicine. This adulteration, and most others likely to occur, may be detected by heating the powdered arsenious acid in a crucible; whatever is not volatilized is an impurity.

Incompatibles.—Acids and acidulous salts, hydrosulphuric acid after the addition of an acid; hydrosulphates, sulphuret of potassium and similar compounds; lime-water; earthy salts, such as alum, sulphate of magnesia, and chloride of calcium; metallic salts, as sulphate and sesquichloride of iron, nitrate of silver, and sulphate of copper; decoction of cinchona.

Medicinal Uses.—This solution is a powerful tonic; it is especially employed in intermittent and remittent fevers, periodic headaches, and some diseases of the skin. Dose, *four minims* to *fifteen minims,* twice a day.

PRÆPARATA È BARIO.

PREPARATIONS OF BARIUM.

BARII CHLORIDUM.

Chloride of Barium.

Take of Carbonate of Barytes, broken into small pieces, ten ounces,
Hydrochloric Acid half a pint,
Distilled Water two pints;

Mix the Acid with the Water, and add the Carbonate of Barytes gradually to them. Then, heat being applied, and the effervescence finished, strain and boil down the liquor, that crystals may be formed.

Remarks.—Barium is a metal which has been procured only in small quantities, and its properties are but imperfectly known; chemists are, however, well acquainted with many of its compounds, especially those with oxygen and chlorine; with oxygen it forms the alkaline earth, or metallic oxide, barytes; this is met with in large quantity in the state of carbonate and of sulphate of barytes.

Barytes or oxide of barium when pure is nearly colourless, inodorous, soluble in water, and when dissolved in hot water the solution yields crystals on cooling. It has strongly-marked alkaline properties, a disagreeable caustic taste, is extremely poisonous and combines readily with acids.

It is composed of

One equivalent of Oxygen	8	or	10·5
One equivalent of Barium	68	„	89·5
Equivalent......	76.		100·

Symbol,—Berzelius and Turner BaO.
Brande .... $(ba+o)$ or B.

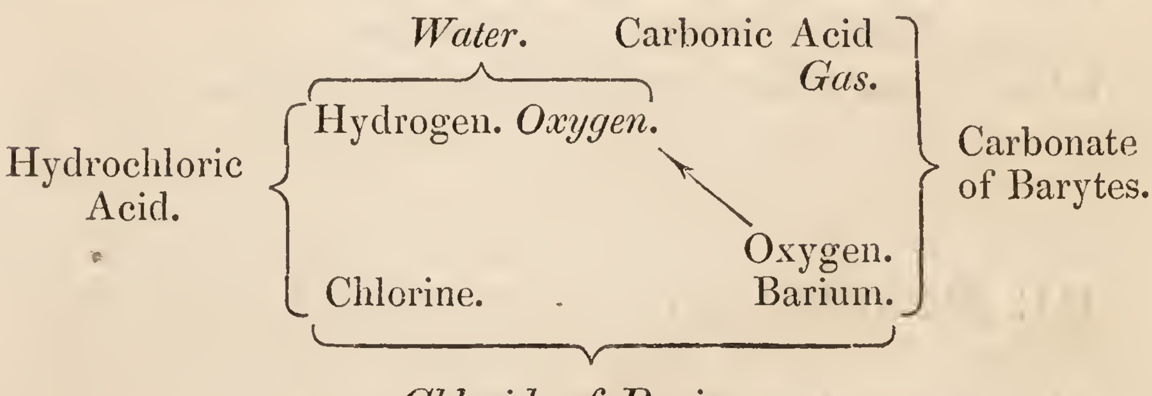
Carbonate of barytes is usually found in amorphous masses, though occasionally crystallized. It is moderately hard, but easily powdered, nearly or quite colourless, sometimes translucent and very heavy. It is almost insoluble in water, but readily decomposed by acids, moderately diluted, with effervescence.

It consists of

One equivalent of Carbonic Acid ..	22	or 22·5
One equivalent of Barytes	76	,, 77·5
Equivalent....	98.	100·

Symbol,—Berzelius and Turner .. Ba O, Ca O^2.
Brande .... $(B + car')$.

Process.—When carbonate of barytes is acted upon by hydrochloric acid, not only is the carbonic acid expelled and the barytes dissolved, but owing to the mutual decomposition of the barytes or oxide of barium and hydrochloric acid, water and chloride of barium are formed.



Properties.—Chloride of Barium yields a colourless solution which by evaporation gives crystals in rhombic plates: of these 100 parts of water at 60° dissolve about 40 parts; the boiling-point of a saturated solution is 222°, and this consists of 100 parts of water and 78 of crystals. The solution is immediately decomposed by sulphuric acid and sulphates, and by the alkaline carbonates, but ammonia gives no precipitate in it; by exposure to a moderate degree of heat, the crystals lose their water; but the salt is not decomposed even at a very high temperature.

Anhydrous Chloride of Barium consists of

One equivalent of Chlorine	36	or 34·6
One equivalent of Barium	68	,, 65·4
Equivalent....	104.	100·

The crystals consist of

One equivalent of anhydrous Chloride of Barium..	104	or 85·3
Two equivalents of Water	18	„ 14·7
Equivalent....	122.	100·

Symbol,—Berzelius and Turner.... Ba Cl, 2HO.
Brande .... $(ba+c+2q)$.

Uses.—This salt has been occasionally employed in medicine; but it is principally used as a reagent for detecting the presence of sulphuric acid and sulphates; for which purpose the following solution is directed to be prepared.

LIQUOR BARII CHLORIDI.

Solution of Chloride of Barium.

Take of Chloride of Barium a drachm,
Distilled Water a fluidounce;
Dissolve the Chloride of Barium, and strain.

PRÆPARATUM E BISMUTHO.

PREPARATION OF BISMUTH.

BISMUTHI TRISNITRAS.

Trisnitrate of Bismuth.

Bismuthi Subnitras, P.L. 1824.

Take of Bismuth an ounce,
Nitric Acid a fluidounce and a half,
Distilled Water three pints;

Mix a fluidounce of the Water with the Nitric Acid, and dissolve the Bismuth in them; then pour off the so-

lution. To this add the rest of the Water, and set by that the powder may subside. Afterwards, the supernatant liquor being poured off, wash the Trisnitrate of Bismuth with Distilled Water, and dry it with a gentle heat.

Remarks.—Bismuth is a metal of a reddish white colour; it is brittle, and easily reduced to powder; its structure is usually crystalline, and by cautious cooling after it has been melted, it may be made to assume a cubic form. Its specific gravity is 9·882; it melts at the temperature of 476°. By exposure to the air it tarnishes, but does not readily oxidize in it unless heated, and then it is converted into a yellow oxide, consisting of

One equivalent of Oxygen	8	or	10
One equivalent of Bismuth......	72	„	90
Equivalent....	80.		100.

Symbol,—Berzelius and Turner.. Bi O.

Brande .... $(bi + o$ or $\mathrm{Bi})$.

Process.—In preparing the nitrate of bismuth, part of the nitric acid is decomposed, with the occurrence of phænomena and effects similar to those which have been described as taking place during the solution of silver in nitric acid. See ARGENTI NITRAS. The oxide of bismuth formed is held in solution by, and forms a nitrate with, the nitric acid remaining undecomposed.

The solution of nitrate of bismuth is colourless, and when water is added to it, as directed in the formula, it combines with the greater part of the acid; it, however, retains some oxide of bismuth in solution, and a white precipitate is formed, which is a trisnitrate of bismuth, composed of

One equivalent of Nitric Acid............	54	or	18·36
Three equivs. of Oxide of Bismuth $80 \times 3 =$	240	„	81·64
Equivalent....	294.		100·

Symbol,—Berzelius and Turner...... $3\mathrm{BiO}, \mathrm{NO}^5$.

Brande .... $(3\mathrm{Bi} + n')$.

Peroxide of Bismuth is a heavy brown powder; it is a sesquioxide, composed of $1\frac{1}{2}$ equivalent of oxygen $12 + 72$ bismuth $= 84$. It does not form salts with acids, but is decomposed by them with the evolution of oxygen.

Properties.—Trisnitrate of Bismuth was formerly employed as a cosmetic, under the name of magistery of bismuth. It is a

white, inodorous, tasteless powder, and is insoluble in water. It is rendered black by hydrosulphuric acid.

Impurities and Tests.—See Notes: BISMUTHI TRISNITRAS.

Medicinal Uses.—This medicine is represented to possess antispasmodic powers, and to be especially serviceable in those forms of dyspepsia which are attended with painful contractions of the stomach. Dose, from gr. v. to gr. xv.

PRÆPARATA È CALCIO.

PREPARATIONS OF CALCIUM.

CALX.

Lime.

Calx Viva, P.L. 1721.
Calx, P.L. 1746, P.L. 1809, P.L. 1824.

Take of Chalk a pound;

Break it into small pieces, and burn it in a very strong fire for an hour.

Remarks.—Chalk is composed of carbonic acid and lime, and lime is the oxide of the metal calcium, first obtained by Davy in 1808 by the agency of voltaic electricity. An amalgam of mercury and calcium was formed, and in attempting to separate the mercury by distillation, and after the greater part of it had been expelled, the tube broke, and the metal calcium, which had the colour and lustre of silver, instantly took fire, and burnt with an intense white light into lime: that it is a white combustible metal, is nearly all that is known respecting calcium.

Lime is composed of

One equivalent of Oxygen........	8	or	28·58
One equivalent of Calcium	20	„	71·42
Equivalent......	28.		100·

Symbol,—Berzelius and Turner.... Ca O.
Brande .... $(cal + o)$ or C.

Carbonate of Lime consists of

One equivalent of Carbonic Acid	22	or 44
One equivalent of Lime	28	,, 56
Equivalent	50.	100·

Symbol,—Berzelius and Turner. . CaO, CO^2.
Brande. . . . . $(C + car^{\prime})$.

Process.—By the action of heat the carbonic acid is expelled from the chalk or carbonate of lime; and, as the pure part of chalk, marble, and limestone contains 44 per cent. of carbonic acid, 100 parts should furnish 56 of lime. If the quantity remaining exceed this, the excess must be derived either from earthy impurity, or from a portion of the chalk or limestone remaining undecomposed by the heat. The impurities which limestone contains are insoluble in water, and unimportant in all cases for medicinal uses.

Properties.—Pure lime is colourless, moderately hard, but easily reduced to powder; unlike the limestone from which it is procured, it is sonorous, although but slightly. It is inodorous, and has a burning, alkaline taste, and it corrodes animal substances. Vegetable blue colours are changed to green by lime, and yellow to brown, evincing its alkaline properties. By exposure to the air it imbibes moisture and falls to powder, and is gradually reconverted to the state of carbonate by combining with the carbonic acid of the atmosphere.

When a little water is poured upon lime it is rendered extremely hot, swells, becomes powdery, and combining with a portion of the water is converted into hydrate of lime. Lime is slightly soluble in water, and the solution possesses alkaline properties. If lime be long exposed to atmospheric air it loses its property of slacking, owing to its having combined with water and carbonic acid, and it is then unfit for use.

Hydrate of Lime, or, as it is usually termed, *slacked lime,* is composed of

One equivalent of Lime	28	or 75·68
One equivalent of Water	9	,, 24·32
Equivalent....	37.	100·

Incompatibles.—All acids and acidulous salts, alkaline carbonates, ammoniacal salts, metallic salts, borates, and astringent vegetable infusions.

Pharmacopœia Preparations.—Calcii Chloridum, Calx Chlorinata, Liquor Calcis, Potassa cum Calce.

Pharmacopœia Uses.—Liquor Ammoniæ, Liquor Potassæ.

LIQUOR CALCIS.

Lime Water.

Aqua Calcis, P.L. 1721.
Aqua Calcis Simplex, P.L. 1746.
Aqua Calcis, P.L. 1788.
Liquor Calcis, P.L. 1809, P.L. 1824.

Take of Lime half a pound;
Distilled Water twelve pints;

Upon the Lime, first slacked with a little of the Water, pour the remaining Water, and shake them together; then immediately cover the vessel, and set it by for three hours; afterwards keep the Solution with the remaining Lime in stopped glass vessels, and when it is to be used, take from the clear Solution.

Process.—This is a simple solution of lime in water. Unlike most other substances, lime is more soluble in cold water than in hot; and when lime-water which has been prepared with cold water is heated, small crystals of lime, probably containing water, are formed and deposited.

I find that

A pint of water at	32° dissolves	13·25	grains of Lime.
Ditto	60	11·6	ditto
Ditto	212	6·7	ditto

It is then evident that water at 32° takes up nearly one-seventh more lime than water at 60°, and almost double the quantity dissolved by boiling water.

Properties.—Lime-water is colourless and inodorous, but has a disagreeable alkaline taste. It turns vegetable blues green, and yellows brown; and it unites with oil by agitation, forming an imperfect soap. When lime-water is exposed to the atmosphere it absorbs carbonic acid, a thin crust of carbonate of lime is rapidly formed on the surface, and eventually the whole of the lime is precipitated from solution; on this account lime-water should be preserved from the air as carefully as possible.

Incompatibles.—Lime-water is incompatible with the substances already enumerated with respect to lime itself.

Pharmacopœia Use.—Hydrargyri Oxydum.

Medicinal Uses.—It is antacid, and therefore useful in dyspepsia attended with acidity; it is also astringent in leucorrhœa, in the last stages of dysentery, and in protracted diarrhœa. Dose, with milk, f℥j. to f℥vj.

CALCII CHLORIDUM.

Chloride of Calcium.

Calcis Murias, P.L. 1809, edit. alt., P.L. 1824.

Take of Chalk five ounces,
Hydrochloric Acid,
Distilled Water, each half a pint;

Mix the Acid with the Water; and to these gradually add the Chalk to saturation. Then the effervescence being finished, strain; evaporate the liquor until the salt is dried. Put this into a crucible, and having melted it in the fire, pour it out upon a flat clean stone. Lastly, when it is cold break it into small pieces, and keep it in a well-closed vessel.

Process.—It has been already shown that hydrochloric acid is a compound of chlorine and hydrogen, and that lime is composed of calcium and oxygen; when carbonate of lime is dissolved in the acid it is converted into chloride of calcium. The changes that occur are, that the carbonic acid is expelled in the state of gas; the hydrogen of the acid combines with the oxygen of the lime to form water; and the chlorine and calcium uniting constitute chloride of calcium; the water used, and that formed, being expelled by evaporation during fusion.

Carbonic Acid *Gas*.

Hydrochloric Acid { Hydrogen. — Oxygen. → *Water*.

Chlorine. — Calcium. → *Chloride of Calcium*.

} Chalk.

Properties.—Chloride of Calcium is colourless, translucent, and inodorous; its taste is very bitter and pungent. By exposure to the air it deliquesces, and is of course very soluble in water; at 60°, water dissolves nearly four times its weight, and hot water still more. By evaporation the solution yields crystals containing a large quantity of water. It is also very soluble in alcohol.

Composition.—The salt is composed of

One equivalent of Chlorine............	36	or	64·3
One equivalent of Calcium	20	„	35·7
Equivalent......	56.		100·

Symbol,—Berzelius and Turner	Ca Cl.
Brande	$(cal+c)$.

Impurities and Tests.—See Notes: Calcii Chloridum.

Incompatibles.—This salt is decomposed by sulphuric acid and by sulphates, by the alkalis, potash, soda, and their carbonates. If ammonia be added to the solution, no change occurs; but carbonate of ammonia decomposes it, and precipitates carbonate of lime.

Pharmacopœia Preparation.—Liquor Calcii Chloridi.

Pharmacopœia Use.—Alcohol.

For *Medicinal Uses,* see Liquor Calcii Chloridi.

LIQUOR CALCII CHLORIDI.

Solution of Chloride of Calcium.

Liquor Calcis Muriatis, P.L. 1809, edit. alt., P.L. 1824.

Take of Chloride of Calcium four ounces,
Distilled Water twelve fluidounces;
Dissolve the Chloride of Calcium, and strain.

Remarks.—The solution ordered in the last Pharmacopœia was about double the strength of the present; it was however so concentrated as to crystallize in cold weather.

Medicinal Uses.—Deobstruent and tonic; it is stated to have been advantageously given in bronchocele and scrofula.

Dose, ♏xl. to f℥ij., or more.

CALX CHLORINATA.

Chlorinated Lime.

Take of Hydrate of Lime a pound,
Chlorine as much as may be sufficient;

Pass Chlorine to the Lime, spread in a proper vessel, until it is saturated.

Chlorine is very readily evolved from Hydrochloric Acid added to Binoxide of Manganese, with a gentle heat.

Remarks.—The exact nature of this compound not having been yet determined, the term *chlorinated lime* is provisionally given to it.

This substance is prepared very largely for the use of the bleacher, and is called *bleaching powder*, when so employed. It was formerly termed also Oxymuriate of Lime; it is now known by the name of Chloride of Lime. Berzelius, however, regards it as a chlorite, and Balard as a hypochlorite of lime; but in the absence of positive proof I shall consider it, what it has been long termed, a chloride of lime.

Process.—On this view of the subject, when hydrochloric acid acts upon binoxide of manganese, the changes that take place are these: two equivalents of hydrochloric acid are composed of two eqs. of hydrogen=2, and two eqs. of chlorine=72; one eq. of binoxide of manganese consists of two eqs. of oxygen=16, and one eq. of manganese=28; when these act upon each other, the two eqs. of hydrogen combine with the two eqs. of oxygen and form two eqs. of water, while one of the eqs. of chlorine unites with one eq. of manganese to form chloride of manganese, and the other eq. of chlorine is evolved in the gaseous state, and being absorbed by the lime, chloride of lime, the *calx chlorinata* of the Pharmacopœia, is formed.

$$
\text{72 Hydro-chloric Acid.}\left\{\begin{array}{ll}
\underbrace{\text{2 Hydrogen.} \qquad\qquad \text{16 Oxygen.}}_{\text{18 }\textit{Water.}} & \\
 & \\
\text{36 Chlorine } \textit{Gas.} & \\
\underbrace{\text{36 Chlorine.} \qquad + \text{Manganese 28.}}_{\text{64 }\textit{Chloride of Manganese.}} &
\end{array}\right\}\text{44 Binoxide of Manganese.}
$$

When chlorine gas ceases to be absorbed, the chloride of lime obtained appears, from the statements of Brande and Grouvelle, and also from my own experiments, to consist of

One equivalent of Chlorine	....	36
Two equivalents of Hydrate of Lime	.... $37 \times 2 =$	74
	Equivalent	110.

When water is added to this, the chloride of lime dissolves, eaving nearly all the lime insoluble; it is therefore probably composed of

One eq. of Bihydrated Chloride of Lime	.. $18 + 36 + 28 =$	82
One equivalent of Lime	....	28
	Equivalent	110.

It appears extremely probable that the whole of the lime is not converted into chloride, on account of the deficiency of water; for when dry chlorine acts upon anhydrous lime, the lime is decomposed, oxygen gas is evolved, and chloride of calcium remains. Dr. Thomson also states that a compound of one equivalent each of chlorine and lime is now formed at Glasgow; such a compound probably results from the intervention of water, as also indicated by the experiments of Houton-Labillardière.

Properties.—Chloride of Lime, when pure, is white, but generally has a brownish tint; it emits a weak smell of chlorine, and its taste is strong. It is only partially soluble in water, the lime uncombined with chlorine being comparatively insoluble. It possesses powerful bleaching properties: when exposed to the air it is gradually decomposed, chlorine is given out, and carbonate of lime formed. It is also decomposed by heat; some chlorine gas comes over first, and afterwards oxygen derived from the decomposition of the lime, chloride of calcium remaining.

Incompatibles.—Acids, as the nitric, hydrochloric, sulphuric, and carbonic, and the alkaline carbonates decompose it; the acids evolve chlorine copiously, and the carbonates precipitate carbonate of lime, while the alkaline chlorides formed remain in solution.

Uses.—It is employed as a disinfectant; when exposed to the air the carbonic acid which it contains evolves chlorine; this powerfully corrects the putrid odour arising either from diseased or decomposing animal matter. It is commonly called Labarracque's Disinfecting Fluid.

CRETA PRÆPARATA.

Prepared Chalk.

Creta Præparata, P.L. 1721, P.L. 1746, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Chalk a pound,
Water as much as may be sufficient;

Add a little Water to the Chalk, and rub it that it may become fine powder. Put this in a large vessel with the rest of the Water; then stir it, and after a short interval, pour off the supernatant water, still turbid, into another vessel, and set it by that the powder may subside; lastly, the Water being poured off, dry this powder and keep it for use.

In the same way shells, first freed from impurities and washed with boiling water, are prepared.

Process.—This method of preparing this variety of carbonate of lime called chalk, is termed elutriation, and is an effectual method of reducing it to a fine powder.

Properties.—Chalk is a substance so well known, that it is hardly requisite to notice its qualities. When pure it is very nearly white. It is dull, opaque, soft, and light, and it always occurs massive. Its sp. gr. is about 2·3; it is sometimes of a greyish tint, and then contains an admixture of foreign matter.

Composition.—By the analysis of Bucholz, chalk is composed of

Carbonic Acid	43
Lime	56·5
Water	·5
	100·

The water is an accidental admixture, and, when perfectly pure, carbonate of lime is composed of

One equivalent of Carbonic Acid	22	or	44
One equivalent of Lime	28	„	56
Equivalent	50.		100·

Symbol,—Berzelius and Turner.. CaO, CO^2.
Brande .... $(C + car')$.

Impurities and Tests.—See Notes: CRETA.

Adulteration.—Chalk is so cheap an article that accidental admixture only can be suspected. If, however, what is termed *grey chalk* be used, the prepared chalk will contain some foreign matter, and the colour will be less perfect.

Incompatibles.—Chalk, or carbonate of lime, is incompatible with acids and acidulous salts, for they combine with its base and expel the carbonic acid in the state of gas.

Pharmacopœia Preparations.—Calcii Chloridum, Calx, Creta Præparata, Confectio Aromatica, Hydrargyrum cum Cretâ, Mistura Cretæ, Pulvis Cretæ Compositus, Unguentum Plumbi Compositum.

Pharmacopœia Uses.—Acidum Citricum, Acidum Tartaricum, Ammoniæ Sesquicarbonas, Potassæ Bicarbonas, Sodæ Sesquicarbonas.

Medicinal Uses.—It is antacid and absorbent, and therefore it is useful in acidities of the primæ viæ, and in diarrhœa, after removing all irritating matters by previous evacuation. It is also a good application to ulcers discharging thin ichorous matter. Dose, gr. x. to gr. xl. or more.

PRÆPARATA È CUPRO.

PREPARATIONS OF COPPER.

CUPRI AMMONIO-SULPHAS.

Ammonio-sulphate of Copper.

Cuprum Ammoniatum, P.L. 1809, P.L. 1824.

Take of Sulphate of Copper an ounce,
Sesquicarbonate of Ammonia an ounce and a half;

Rub them together until Carbonic Acid ceases to evolve; then dry the Ammonio-sulphate of Copper, wrapped in bibulous paper, in the air.

Remarks.—Copper forms two different compounds with oxygen; the first is of a red colour, and is a dinoxide composed of one equivalent of oxygen 8, and two equivalents of copper

64=72; this does not yield salts with acids. The oxide is black, and consists of one equivalent of oxygen 8, and one of copper 32=40. It combines with acids to form salts.

Sulphate of Copper is a salt well known by the names of Blue Vitriol or Roman Vitriol; it is of a fine blue colour, crystallizes in right rhombic prisms, and dissolves readily in water. It consists of

One equivalent of Sulphuric Acid	40	or 34·48
One equivalent of Oxide of Copper	40	„ 34·48
Five equivalents of Water	45	„ 31·04
Equivalent	125.	100·

Symbol,—Berzelius and Turner .... $CuO, SO^3, 5HO$.
Brande .... $(Cu + \mathit{S'} + 5q)$.

When sulphate of copper is triturated with sesquicarbonate of ammonia, decomposition ensues, and carbonic acid is expelled in the state of gas from a portion of the ammoniacal carbonate; there appear to be formed sulphate of ammonia and carbonate of copper, which with the excess of the sesquicarbonate of ammonia employed, form the Cupri Ammonio-sulphas.

Carbonic Acid *Gas.*

Sulphate of Copper. { Sulphuric Acid. | Oxide of Copper. }

{ Ammonia. | Carbonic Acid. } Sesquicarbonate of Ammonia.

Sulphuric Acid + Ammonia = *Sulphate of Ammonia.*

Oxide of Copper + Carbonic Acid = *Carbonate of Copper.*

Carbonate of Copper. + Sesquicarbonate of Ammonia. = *Cupri Ammonio-Sulphas.*

Properties.—This compound, when it has not been too much dried, and retains some excess of sesquicarbonate of ammonia, is of a fine azure blue colour, has an ammoniacal smell, and a styptic metallic taste.

Composition.—This must be liable to some variation, dependent upon its state of dryness, and the excess of the ammoniacal carbonate.

Impurities and Tests.—See Notes: CUPRI AMMONIO-SULPHAS.

Incompatibles.—This preparation is incompatible with acids; the alkalis potash and soda, and with lime-water.

Pharmacopœia Preparation.—Liquor Cupri Ammonio-sulphatis.

Medicinal Uses.—It is tonic and antispasmodic. It has been employed in chorea, and also advantageously in epilepsy. Dose, *one quarter of a grain*, cautiously increased to *five grains*, twice a day. It is given in the form of pills, made up with crumb of bread.

LIQUOR CUPRI AMMONIO-SULPHATIS.

Solution of Ammonio-sulphate of Copper.

Aqua Sapphirina, P.L. 1721, P.L. 1746.
Aqua Cupri Ammoniati, P.L. 1788.
Liquor Cupri Ammoniati, P.L. 1809, P.L. 1824.

Take of Ammonio-sulphate of Copper a drachm,
Distilled Water a pint;
Dissolve the Ammonio-sulphate of Copper in the water, and strain.

Properties.—This solution has a fine blue colour, but unless the ammonio-sulphate of copper retains some excess of sesqui-carbonate of ammonia, I have found that it is decomposed, and the oxide of one half of the salt of copper is precipitated.

Medicinal Uses.—It is detergent and mildly escharotic. When still more largely diluted, it is employed in removing specks from the cornea.

PRÆPARATA È FERRO.

PREPARATIONS OF IRON.

FERRI SULPHAS.

Sulphate of Iron.

Sal seu *Vitriolum Martis*, P.L. 1721.
Sal Martis, P.L. 1746.
Ferrum Vitriolatum, P.L. 1788.
Ferri Sulphas, P.L. 1809, P.L. 1824.

Take of Iron Filings eight ounces,
Sulphuric Acid fourteen ounces,
Water four pints;

Mix the Sulphuric Acid with the Water, and add the Iron to them; then apply heat, and when bubbles have ceased to escape, strain the liquor, and set it aside that crystals may be formed. Evaporate the liquor poured off that it may again yield crystals. Dry them all.

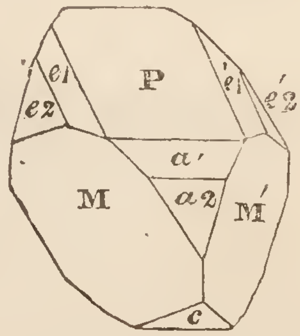
Process.—Concentrated sulphuric acid and iron do not act upon each other at common temperatures, but if the acid be diluted with water, rapid action takes place. Water consists of oxygen and hydrogen, and a portion of it is decomposed by the action of the sulphuric acid and iron. Its oxygen combines with the iron to form oxide or protoxide of iron, and its hydrogen being set at liberty, assumes the elastic form and is evolved in the state of gas. The oxide of iron is dissolved by the sulphuric acid, and sulphate of iron is formed.

$$\underbrace{\text{Sulphuric Acid.} \quad \underbrace{\text{Iron.} \quad \left.\begin{matrix}\text{Hydrogen } \textit{Gas.} \\ \text{Oxygen.}\end{matrix}\right\} \text{Water.}}_{\textit{Oxide of Iron.}}}_{\textit{Sulphate of Iron.}}$$

The solution of sulphate of iron thus obtained is of a bluish green colour, the iron being in the state of protoxide; if it be long exposed to the air, it first loses its blue tint, owing to the absorption of oxygen, which converts the protoxide into sesqui- or per-oxide of iron, and eventually it becomes of a reddish yellow colour.

Properties.—The primary form of sulphate of iron is *an oblique rhombic prism,* M M′ and P of the annexed figure being the primary planes: the crystals sometimes exhibit the secondary planes *a* and *e*.

P on M, or M′	99° 20′
M on M′	82 20
P on e_1	153 00
P on e_2	123 55
P on a_1	159 00
P on a_2	136 10



The crystals, when recently formed, are of a bluish green colour; by exposure to the air the protoxide of iron which the salt contains attracts oxygen, and the reddish yellow colour of the sesquioxide of iron formed, renders the crystals green by admix-

ture with the blue protosulphate of iron. When the exposure has been long continued, the surface of the crystals is incrusted with subsulphate of sesquioxide of iron, and they ought then to be rejected; the solution, as already noticed, attracts oxygen, and it is rendered first green and then reddish, depositing at the same time a considerable quantity of subsulphate of sesquioxide of iron.

Sulphate of Iron has a disagreeable stypic taste; it is soluble in about two parts of cold water and 3-4ths of its weight of boiling water. The solution is precipitated of a greenish white by alkalis; the oxide thrown down gradually absorbs oxygen, and becomes red, or sesquioxide of iron; when free from this, the ferrocyanide of potassium occasions a white precipitate, which becomes speedily blue by exposure to the air. When the solution has absorbed oxygen by the action of the air, or by any other means, it then gives immediately a deep blue precipitate with the same test, and a black one with astringent vegetable infusions and tinctures.

By exposure to a moderate heat the crystals lose 6-7ths of their water, their crystalline form, and become white and powdery; subjected to a strong heat they are decomposed, yielding a peculiar kind of sulphuric acid, and sesquioxide of iron.

Composition of the Oxides of Iron.—There are two well-marked oxides of this metal, the protoxide and the peroxide or sesquioxide; and there is an ore of iron, which is either a peculiar oxide, or is a compound of the protoxide and sesquioxide.

The two oxides first mentioned consist of

Protoxide,	One equivalent of Oxygen	8	or	22·2
	One equivalent of Iron	28	,,	77·8
	Equivalent....	36.		100·
Sesquioxide,	One and a half eq. of Oxygen .	12	or	30
	One equivalent of Iron	28	,,	70
	Equivalent....	40.		100·

Composition of Sulphate of Iron.

One equivalent of Sulphuric Acid	40	or	28·8
One equivalent of Protoxide of Iron	36	,,	25·9
Seven equivalents of Water	63	,,	45·3
Equivalent....	139.		100·

Symbols.

Protoxide of Iron.	Berzelius and Turner ..	Fe O.
	Brande	Fe.

Sesquioxide of Iron.	Berzelius and Turner..	$Fe\,O^{1\frac{1}{2}}$.
	Brande	$(fe+1\frac{1}{2}o)$.
Sulphate of Iron.	Berzelius and Turner..	$FeO, SO^3, 7HO$.
	Brande	$(Fe+s'+7q)$.

Impurities and Tests.—See Notes: FERRI SULPHAS.

Incompatibles.—Ammonia, potash, soda, and their carbonates, lime-water, chloride of calcium, nitrate of silver, the acetates of lead, and soaps. The salts of barytes and strontia, as well as the earths they contain, are incompatible with this salt. It is decomposed also by astringent vegetable bodies.

Pharmacopœia Preparations.—Mistura Ferri Composita, and Pilulæ Ferri Compositæ.

Pharmacopœia Use.—Ferri Sesquioxydum.

Medicinal Uses.—Tonic, astringent, emmenagogue, and anthelmintic; in large doses it occasions griping in the bowels. Dose, gr. j. to v. or more, made into pills with extract of gentian. It should never be given in solution without previously boiling the water, to free it from atmospheric air, the oxygen of which is readily absorbed, and the sulphate of iron is decomposed by it.

FERRI SESQUIOXYDUM.

Sesquioxide of Iron.

Crocus Martis Astringens, P.L. 1721.
Chalybis Rubigo Præparata, P.L. 1746.
Ferri Rubigo, P.L. 1788.
Ferri Carbonas, P.L. 1809.
Ferri Subcarbonas, P.L. 1809, edit. alt., P.L. 1824.

Take of Sulphate of Iron four pounds,
Carbonate of Soda four pounds and two ounces,
Water, boiling, six gallons;

Dissolve the Sulphate of Iron and Carbonate of Soda separately, in three gallons of Water; then mix the liquors together, and set them by, that the powder may subside. Lastly, the supernatant liquor being poured off, wash what is precipitated with water, and dry it.

Process.—The nature of sulphate of iron has been stated; carbonate of soda is the alkaline salt, formerly called subcarbonate of soda.

When the solutions of these salts are mixed, double decomposition takes place. The carbonic acid of the carbonate combines with the oxide of iron of the sulphate, and the carbonate of iron formed being insoluble in water, it is precipitated; the soda of the carbonate unites with the sulphuric acid of the sulphate of iron, and the sulphate of soda resulting being soluble, remains in solution.

Sulphate of Soda.

Carbonate of Soda.	Soda.	Sulphuric Acid.	Sulphate of Iron.
	Carbonic Acid.	Oxide of Iron.	

Carbonate of Iron.

The formation of the carbonate or protocarbonate of iron is the first step in the process; during the washing which is necessary to get rid of the sulphate of soda, and especially by the subsequent exposure to the air whilst drying, the protoxide of iron acquires oxygen, and loses carbonic acid, and thus becomes sesquioxide of iron.

Carbonate of Iron.	Carbonic Acid *Gas.*	Azote.	Atmospheric Air.
	Protoxide of Iron.	Oxygen.	

Sesquioxide of Iron.

This compound, however, generally contains a small quantity of carbonic acid; it is prepared nearly in the same mode as what was called *Subcarbonate of Iron* in the last Pharmacopœia, and which usually was, what it is now termed, merely sesquioxide of iron.

Properties.—This preparation is of a reddish-brown colour; it is inodorous and has a disagreeable taste; is insoluble in water, and not readily dissolved by any acid except the hydrochloric acid.

Composition and Symbols have been already given.

Impurities and Tests.—See Notes: FERRI SESQUIOXYDUM.

Incompatibles.—Acids and Acidulous Salts.

Pharmacopœia Uses.—Ferri Ammonio-chloridum, Ferri Potassio-tartras, Tinctura Ferri Sesquichloridi.

Medicinal Uses.—Tonic and emmenagogue. Dose, from gr. v. to xxx. combined with myrrh or aromatics. In doses of half a drachm to a drachm, two or three times a day, it has proved efficacious in tic douloureux. Dr. Elliotson states that in doses of ʒj. to ʒiv. every six hours he has employed it successfully in chorea.

TINCTURA FERRI SESQUICHLORIDI.

Tincture of Sesquichloride of Iron.

Tinctura Martis cum Spiritu Salis, P.L. 1721.
Tinctura Martis in Spiritu Salis, P.L. 1746.
Tinctura Ferri Muriati, P.L. 1788.
Tinctura Ferri Muriatis, P.L. 1809, P.L. 1824.

Take of Sesquioxide of Iron six ounces,
Hydrochloric Acid a pint,
Rectified Spirit three pints;

Pour the Acid upon the Sesquioxide of Iron in a glass vessel, and digest for three days, frequently shaking. Lastly, add the spirit and strain.

Process.—When sesquioxide of iron is acted upon by hydrochloric acid they undergo mutual decomposition; the hydrogen of the acid combines with the oxygen of the oxide to form water, and the chlorine of the acid combining with and dissolving the iron, they form sesquichloride of iron.

	$1\frac{1}{2}$ equiv. *Water.*		
$1\frac{1}{2}$ equiv. Hydrochloric Acid.	$1\frac{1}{2}$ eq. Hydrogen.	$1\frac{1}{2}$ eq. Oxygen.	1 equiv. Sesquioxide of Iron.
	$1\frac{1}{2}$ eq. Chlorine.	1 eq. Iron.	
	1 equiv. *Sesquichloride of Iron.*		

Sesquichloride of Iron is very soluble both in water and in spirit; it is composed of

One and a half equivalent of Chlorine ..	54	or	65·85
One equivalent of Iron	28	,,	34·15
Equivalent....	82.		100·

Symbol,—Berzelius and Turner.... $Fe\,Cl^{1\frac{1}{2}}$.
Brande .... $(fe+1\frac{1}{2}c)$.

Properties.—This tincture is of a reddish-brown colour, and though it is essentially composed of sesquichloride of iron, it contains some hydrochloric acid, without which a deposit is apt to be formed in it. Its taste is acid and extremely styptic, and its smell resembles that of hydrochloric æther. Its specific gravity is about 0·992, and a fluidounce yields, when decomposed by potash, nearly 30 grains of sesquioxide of iron. Like the salts of the sesquioxide of iron, this solution gives a red colour when mixed with hydrochloric acid, sulphurous acid, or solution of acetate of potash.

Incompatibles.—Alkalis and their carbonates, lime-water, carbonate of lime; magnesia, and its carbonate. It is rendered black by astringent vegetable bodies, and is decomposed by a solution of gum arabic.

Medicinal Uses.—When made with proper care it is one of the most certain and active preparations of iron; and it remains for a very long time without suffering any variation of strength from decomposition. Dose, ♏x. to f℥j.

It is stated to be particularly useful as a tonic in scrofula: in dysuria, ♏x. given every ten minutes until some sensible effect is produced, afford speedy relief; and it is a powerful styptic in hæmorrhage from the bladder, kidneys, or uterus. It is used externally as a styptic in cancerous and fungous sores, and for the purpose of destroying venereal warts.

FERRI POTASSIO-TARTRAS.

Potassio-tartrate of Iron.

Ferrum Tartarizatum, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Sesquioxide of Iron three ounces,
Hydrochloric Acid half a pint,
Solution of Potash four pints and a half, or as much as may be sufficient,
Bitartrate of Potash eleven ounces and a half,
Solution of Sesquicarbonate of Ammonia a pint, or as much as may be sufficient,
Distilled Water three gallons;

Mix the Sesquioxide of Iron with the Acid, and digest for two hours in a sand-bath. Add to these, two gallons of the water, and set aside for an hour; then pour off the supernatant liquor. The solution of Potash being added, wash what is precipitated frequently with water, and while moist boil it with the Bitartrate of Potash, previously mixed with a gallon of the water. If the liquor should be acid when tried by litmus, pour into it solution of Sesquicarbonate of Ammonia until it is saturated. Lastly, strain the liquor, and with a gentle heat let it evaporate, so that the salt may remain dry.

Process.—It has been already explained that, when sesquioxide of iron is dissolved by hydrochloric acid, both are decomposed, and the results are water and sesquichloride of iron; this when mixed with solution of potash is decomposed, and a precipitate is obtained, which is hydrated sesquioxide of iron, and chloride of potassium remains in solution.

Chloride of Potassium.

Sesquichloride of Iron. { Chlorine. Potassium.
Iron. (Water.) Oxygen. } Potash.

Hydrated Sesquioxide of Iron.

When this hydrated sesquioxide of iron is boiled in water with the bitartrate of potash, the excess of acid which this salt contains dissolves the oxide, and a solution is obtained, which, if not quite neutral to the litmus test, is to be saturated by adding the requisite quantity of the solution of sesquicarbonate of ammonia; it consists, essentially, of tartrate of potash and tartrate of sesquioxide of iron, and this evaporated to dryness constitutes the potassio-tartrate of iron.

Properties.—This preparation is of a brownish colour, with a shade of green; it is inodorous, and has but little of the disagreeable taste of the iron, when properly prepared. It is readily soluble in water, and becomes moist in a damp atmosphere. It gives a dark-coloured precipitate with astringent vegetables, but does not afford a blue precipitate with ferrocyanide of potassium; neither potash, soda, nor their carbonates, decompose this so-

lution unless heat be applied, and even then ammonia and its carbonate produce no effect upon it. Of all chalybeate preparations it is the least nauseous, and the solution will remain for a considerable time without suffering decomposition.

Composition.—According to Soubeiran, from whom this much-improved process is taken, with slight alterations, this double salt contains 13 per cent. of sesquioxide of iron. I found it to consist of very nearly

One equivalent of Tartrate of Potash	114	or	51·82
One eq. of Tartrate of Sesquioxide of Iron. .	106	„	48·18
Equivalent. . . .	220.		100·

This would give rather more than 18 per cent. of sesquioxide of iron, which agrees very nearly with my direct experiment.

Impurities and Tests.—See Notes: FERRI POTASSIO-TARTRAS.

Medicinal Uses.—This preparation is advantageously exhibited in all cases in which chalybeates prove useful. From its slight taste it may be readily given when other preparations of iron prove nauseating. The dose is from gr. x. to ℥ss. given either in solution, or in the form of bolus, combined with an aromatic, but it should not be long kept in either way; and in its perfect state it cannot be given in the form of powder, on account of its attracting moisture.

FERRI AMMONIO-CHLORIDUM.

Ammonio-chloride of Iron.

Flores Salis Ammoniaci Martiales, P.L. 1721.
Flores Martiales, P.L. 1746.
Ferrum Ammoniacale, P.L. 1788.
Ferrum Ammoniatum, P.L. 1809, P.L. 1824.

Take of Sesquioxide of Iron three ounces,
Hydrochloric Acid half a pint,
Hydrochlorate of Ammonia two pounds and a half,
Distilled Water three pints;

Mix the Sesquioxide of Iron with the Hydrochloric

Acid in a proper vessel, and digest them in a sand-bath for two hours; afterwards add the Hydrochlorate of Ammonia first dissolved in the distilled Water; strain and evaporate all the liquor. Lastly, rub what remains to powder.

Remarks.—This preparation was ordered in former Pharmacopœias to be sublimed. These directions were however seldom complied with, and the present process will yield a preparation of uniform strength and appearance.

Process.—It has been explained that when sesquioxide of iron is dissolved in hydrochloric acid, the resulting compound is a sesquichloride of iron, which is here mixed with hydrochlorate of ammonia and evaporated to dryness.

Properties.—The colour of this preparation is an orange red; it becomes moist when exposed to the air, is readily dissolved by water, and is partially, at least, soluble in alcohol. It has a sharp saline and metallic taste, but no smell.

Composition.—This is a mixture rather than a definite compound, consisting very nearly of

Sesquichloride of Iron	15
Hydrochlorate of Ammonia......	85
	100.

It yields about 7 per cent. of sesquioxide of iron when decomposed by an alkali.

Impurities and Tests.—See Notes: FERRI AMMONIO-CHLORIDUM.

Incompatibles.—This preparation is decomposed by the alkalis and their carbonates, sesquioxide of iron being precipitated, and ammonia evolved; lime-water produces a similar effect; and like other preparations of iron, it is rendered black by astringent vegetable infusions.

Pharmacopœia Preparation.—Tinctura Ferri Ammonio-chloridi.

Medicinal Uses.—It is stated to be tonic, emmenagogue, and aperient. Its dose may be estimated by what I have mentioned respecting its composition.

TINCTURA FERRI AMMONIO-CHLORIDI.

Tincture of Ammonio-chloride of Iron.

Tinctura Martis Mynsichti, P.L. 1721.
Tinctura Florum Martialium, P.L. 1746.
Tinctura Ferri Ammoniacalis, P.L. 1788.
Tinctura Ferri Ammoniati, P.L. 1809, P.L. 1824.

Take of Ammonio-chloride of Iron four ounces,
Proof Spirit a pint;
Dissolve the Ammonio-chloride of Iron in the Spirit, and strain.

Remarks.—This preparation does not appear to possess any advantage over the Tinctura Ferri Sesquichloridi, and from which it differs chiefly in containing hydrochlorate of ammonia.

A fluidounce yields by decomposition gr. 5·8 of sesquioxide of iron.

FERRI IODIDUM.

Iodide of Iron.

Take of Iodine six ounces,
Iron Filings two ounces,
Distilled Water four pints and a half;
Mix the Iodine with four pints of the Water, and to these add the Iron. Heat them in a sand-bath, and when it has acquired a greenish colour, pour off the liquor. Wash what remains with the half pint of Water, boiling. Let the mixed and strained liquors evaporate at a heat not exceeding 212° in an iron vessel, that the salt may be dried. Keep it in a well-stopped vessel, access of light being prevented.

Remarks.—Iodine is a non-metallic elementary solid body, which was discovered in 1812 by M. Courtois of Paris. Its peculiar properties were first minutely pointed out by Gay-Lussac and Davy. It exists in sea-water, probably combined with sodium, in marine molluscous animals, and sea-weeds. It has also

been found in the mineral kingdom combined with silver. Iodine is principally obtained from *kelp*, which is sea-weed that has been burnt for the purpose of obtaining alkaline salts. The residuary kelp liquor, after getting rid of the impurities which would interfere with the iodine, is heated with sulphuric acid and binoxide of manganese; by this process, and owing to decompositions analogous to those which evolve chlorine from common salt, Iodine is obtained.

The properties of Iodine are, that it is a soft opaque solid of a bluish-black colour and metallic lustre. It is crystalline, and its primary form is a right rhombic prism; the crystals are usually flat. Its specific gravity, according to Dr. Thomson, is about 3·084, while Gay-Lussac makes it 4·948. In vapour its sp. gr. is to that of air as 8·738 to 1. When moderately heated it is vaporized, and its name is derived from the Greek for the violet colour of its vapour; it melts at 225° and boils at about 350°. When the heat by which it was vaporized is withdrawn, it again assumes the form of brilliant crystals, unchanged in properties; nor is it decomposed or altered at high temperatures. Iodine has a strong disagreeable smell and taste, resembling those of chlorine and bromine, and it stains the skin, though not permanently, of a brownish colour. It requires nearly 7000 times its weight of water for solution, but is readily soluble in alcohol, and the solution bleaches like chlorine, and is of a reddish-brown colour. It is very poisonous. A characteristic property, in addition to that of yielding a purple vapour, is that of giving an intense blue colour with a solution of starch. It unites readily with metals forming compounds which are termed *iodides*, and it combines with oxygen to form iodic acid, and with hydrogen to form hydriodic acid gas; it is incombustible, but in vapour is a supporter of combustion.

Process and Properties.—The solution obtained is one of Iodide or Protiodide of iron; it is of a green colour, and by evaporation with as little contact of air as possible, green tabular crystals may be formed. By evaporation to dryness and heating moderately, this salt is fused, and on cooling becomes an opaque crystalline mass of an iron-grey colour and metallic lustre. When exposed to the air it attracts moisture, and is very soluble both in water and in alcohol: in order to prevent the deposition of sesquioxide of iron by the absorption of oxygen, the solution should be kept with an iron wire in it.

Composition.—Iodide or Protiodide of Iron is composed of

One equivalent of Iodine......	126	or	63·3
One equivalent of Iron	28	,,	14·
Five equivalents of Water	45	,,	22·7
Equivalent....	199.		100·

Symbol,—Berzelius and Turner. . Fe I.
Brande . . . . $(fe+i)$.

Impurities and Tests.—See Notes: Ferri Iodidum.

Incompatibles.—This salt is decomposed by the alkalis, ammonia, potash, soda and their carbonates, by lime-water, and all other substances with which sulphate of iron is incompatible.

Medicinal Use.—Employed as an emmenagogue, from one to two grains at a dose.

PRÆPARATA EX HYDRARGYRO.

PREPARATIONS OF MERCURY.

HYDRARGYRUM CUM CRETÂ.

Mercury with Chalk.

Hydrargyrus cum Cretâ, P.L. 1788, P.L. 1809.
Hydrargyrum cum Cretâ, P.L. 1809, edit. alt., P.L. 1824.

Take of Mercury three ounces,
Prepared Chalk five ounces;
Rub them together until globules are no longer visible.

Remarks.—Mercury is a white brilliant metal, which differs from all others in being fluid at common temperatures, and remaining so till exposed to a cold of 40° below zero; it then becomes solid and malleable. At 60° its specific gravity is 13·5; it boils and vaporizes at about 670° Fahr. It is readily acted upon by nitric acid, whether concentrated or dilute, but sulphuric acid has no action upon it except when concentrated and boiling; hydrochloric acid does not produce any effect upon it under any circumstances. It sometimes occurs in its native or metallic state, but usually combined with sulphur, forming native cinnabar or the bisulphuret of mercury.

Process.—I have been informed on authority upon which I can rely, that the addition of a small quantity of water greatly accelerates the operation here directed. I have found that a minute

portion of the mercury is, by the long trituration required, converted into protoxide, and this being the case the effects derived from the use of this medicine are readily accounted for.

Impurities and Tests.—See Notes: HYDRARGYRUM CUM CRETÂ.

Incompatibles.—Acids and acidulous salts act upon this preparation, and dissolve the chalk with the effervescence of carbonic acid gas.

Medicinal Uses.—It is one of the mildest of the mercurial preparations. Dose, as an alterative, gr. x. to gr. xxx.

HYDRARGYRI BICHLORIDUM.

Bichloride of Mercury.

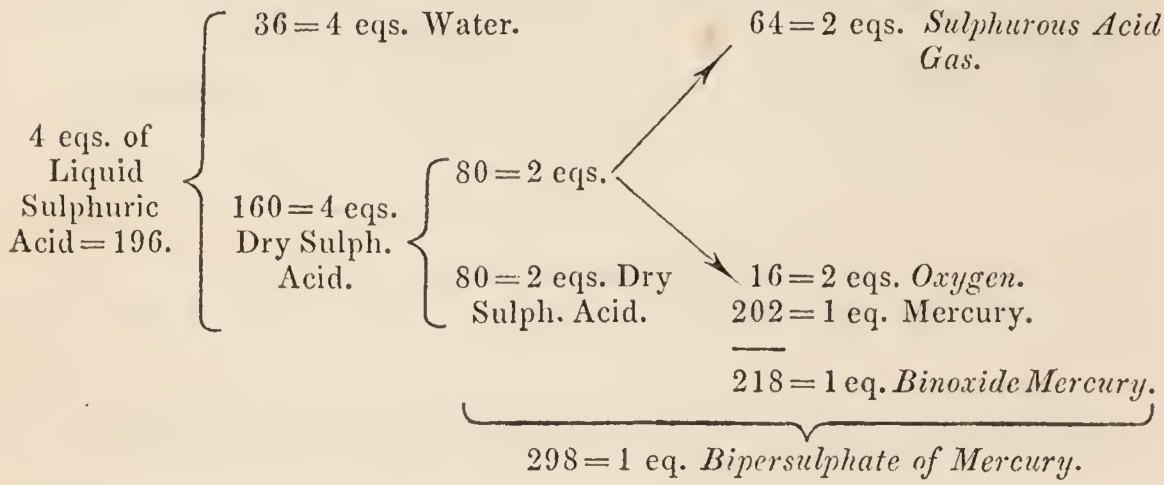
Mercurius Sublimatus Corrosivus, P.L. 1721.
Mercurius Corrosivus Sublimatus vel *Albus,* P.L. 1746.
Hydrargyrus Muriatus, P.L. 1788.
Hydrargyri Oxymurias, P.L. 1809, P.L. 1824.

Take of Mercury two pounds,
Sulphuric Acid three pounds,
Chloride of Sodium a pound and a half;

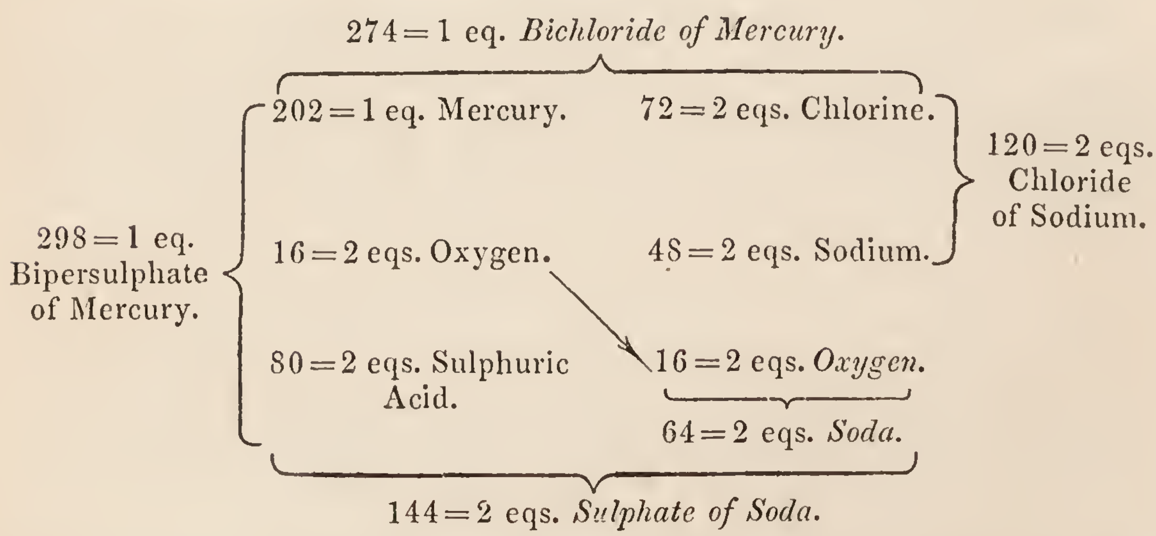
Boil down the Mercury with the Sulphuric Acid in a proper vessel, until the Bipersulphate of Mercury remains dry; rub this when it is cold with the Chloride of Sodium in an earthen mortar; then sublime with a heat gradually raised.

Process.—Supposing the sulphuric acid to be of the greatest density, and the excess of it to be merely evaporated, the changes which occur during the formation of Hydrargyri Bichloridum, commonly called corrosive sublimate, are as follows:—4 eqs. of liquid sulphuric acid=196, consist of 36=4 eqs. of water and 160=4 eqs. of dry sulphuric acid; during ebullition the 36 of water are evaporated; and 80=2 eqs. of dry sulphuric acid are

decomposed into 64=2 eqs. of sulphurous acid gas, which are evolved, and 16=2 eqs. of oxygen, which combine with 202=1 eq. of mercury and form 218=1 eq. of binoxide of mercury, which uniting with 80=2 eqs. of sulphuric acid, remaining undecomposed, there are formed 298=1 eq. of bipersulphate of mercury.

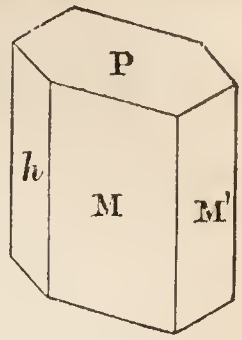


Chloride of Sodium, or common salt, is then mixed and heated in a subliming vessel with these 298=1 eq. of bipersulphate of mercury, consisting, as already stated, of 1 eq. of mercury=202, 2 eqs. of oxygen=16, and 2 eqs. of dry sulphuric acid=80; the 120=2 eqs. of chloride of sodium, are composed of 2 eqs. of chlorine=72 and 2 eqs. of sodium=48; during the action of these substances upon each other, 202=1 eq. of mercury, combine with 2 eqs. of chlorine=72, and form 274=1 eq. of bichloride of mercury; 16=2 eqs. of oxygen separated from the mercury, are transferred to the 2 eqs. of sodium=48 and form 2 eqs. of soda=64, which combining with 80=2 eqs. of sulphuric acid, give 144=2 eqs. of sulphate of soda, remaining in the lower part of the subliming vessel.



Properties.—The bichloride of mercury being volatile at the temperature at which it is formed, rises in vapour, and condenses

into a white semitransparent crystalline mass, from which perfect crystals are occasionally procurable. The cleavages in the crystals of this substance are parallel to the lateral and to the terminal planes of *a right rhombic prism* of 93° 44′, which therefore may be regarded as the primary form.



P on M, or M′	90° 00′
M on M′..................	93 44
M on h	133 8

Bichloride of Mercury is inodorous; it has an acrid and nauseous taste, which remains long in the mouth. It is a violent poison. Its specific gravity is 5·200: water, at 60° Fahr., dissolves rather more than 1-20th, and boiling water one-third of its weight; the solution reddens litmus paper. Although light has no action upon this salt in its solid state, yet it partially decomposes the aqueous solution, and chloride of mercury is precipitated. It is much more soluble in alcohol, æther, hydrochloric acid, and solution of hydrochlorate of ammonia, than in water. When the alkalis potash and soda, or lime-water, are added to a solution of bichloride of mercury, they throw down a yellow precipitate, which is hydrated binoxide of mercury. Carbonate of lime decomposes the bichloride only partially, the substance obtained being oxichloride of mercury of a deep red colour; a similar effect is produced by lime, potash and soda, when used in the requisite proportion. With ammonia a white precipitate is obtained, as will be presently again noticed.

Composition.—Bichloride of Mercury consists of

Two equivalents of Chlorine..	$36 \times 2 =$	72	or	26·27
One equivalent of Mercury ..		202	,,	73·73
	Equivalent..	274.		100·

Symbol,—Berzelius and Turner.. Hg Cl².
Brande .... $(hg+2c)$.

Impurities and Tests.—See Notes: Hydrargyri Bichloridum.

Incompatibles.—Ammonia, potash, soda, and their carbonates; lime-water, potassio-tartrate of antimony, nitrate of silver, the acetates of lead, sulphuret of potassium, hydrosulphates, soap, many metals, infusion of bitter and astringent vegetables, and some vegetable bodies which possess neither of these qualities.

Pharmacopœia Preparation.—Liquor Hydrargyri Bichloridi.

Pharmacopœia Uses.—Hydrargyri Ammonio-chloridum, Hydrargyri Binoxydum.

Medicinal Uses.—It is frequently serviceable in secondary syphilis, and in some cutaneous diseases, particularly combined with an antimonial, in lepra. Dose, from one-eighth to one-fourth of a grain, made into a pill with crumb of bread.

LIQUOR HYDRARGYRI BICHLORIDI.

Solution of Bichloride of Mercury.

Liquor Hydrargyri Oxymuriatis, P.L. 1809, P.L. 1824.

Take of Bichloride of Mercury,
Hydrochlorate of Ammonia, each ten grains,
Distilled Water a pint;

Dissolve the Bichloride of Mercury and Hydrochlorate of Ammonia together in the Water.

Remarks.—In the former Pharmacopœias the solvent power of the water was increased by spirit of wine, instead of hydrochlorate of ammonia as now directed. A fluidounce contains half a grain of bichloride of mercury.

Dose, half a fluidrachm to two fluidrachms in infusion of linseed.

HYDRARGYRI CHLORIDUM.

Chloride of Mercury.

Mercurius Dulcis Præcipitatus. Mercurius Dulcis Sublimatus. Calomelas, P.L. 1721.
Mercurius Dulcis Sublimatus, P.L. 1746.
Calomelas. Hydrargyrus Muriatus Mitis, P.L. 1788.
Hydrargyri Submurias, P.L. 1809, P.L. 1824.

Take of Mercury four pounds,
Sulphuric Acid three pounds,
Chloride of Sodium a pound and a half,
Distilled Water as much as may be sufficient;

Boil two pounds of the Mercury with the Sulphuric Acid in a proper vessel, until the Bipersulphate of Mercury remains dry; rub this when it is cold with [the remaining] two pounds of Mercury in an earthen mortar, that they may be perfectly mixed. Afterwards add the Chloride of Sodium, and rub them together, until globules are no longer visible; then sublime. Rub the sublimate to very fine powder, and wash it carefully with boiling distilled Water and dry it.

Process.—It has been already mentioned, that when mercury and sulphuric acid are boiled together, the metal is converted into bipersulphate, which when rubbed as directed with a quantity of mercury equal to that which it already contains, we may consider as forming with it protosulphate of mercury, or neutral sulphate of the protoxide; for the first portion of mercury yields half its oxygen to the second portion, and both become protoxide, and combine with the sulphuric acid.

$$\begin{array}{c}298=1\text{ eq.}\\ \text{Bipersulphate}\\ \text{of Mercury.}\end{array}\underbrace{\left\{\begin{array}{l}202=1\text{ eq. Mercury}+202=1\text{ eq. Mercury.}\\ 16=2\text{ eqs. Oxygen.}\\ 80=2\text{ eqs. Sulphuric Acid.}\end{array}\right.}_{500=2\text{ eqs. \textit{Protosulphate of Mercury.}}}$$

Two equivalents of protosulphate of mercury are thus necessarily formed, but in explaining the changes by which it is converted into chloride of mercury, it is not requisite to consider more than one equivalent as undergoing them.

When, in order to prepare chloride of mercury, 1 eq. of protosulphate of mercury is heated with 1 eq. of chloride of sodium, the changes which occur are these: 250, the 1 eq. of protosulphate of mercury, composed of 202=1 eq. of mercury, 8=1 eq. of oxygen and 40=1 eq. of sulphuric acid, decomposes 60=1 eq. of chloride of sodium, consisting of 36=1 eq. of chlorine and 24=1 eq. of sodium; the 1 eq. of mercury=202 combines with the 1 eq. of chlorine=36, and forms 238=1 eq. of chloride of mercury; 8 the 1 eq. of oxygen combines with 24 the 1 eq. of sodium, and forms 32=1 eq. of soda, which uniting with 40=the 1 eq. of sulphuric acid, there results 1 eq. of sulphate of soda=72.

238 = 1 eq. *Chloride of Mercury.*

250 = 1 eq. Protosulphate of Mercury: 202 = 1 eq. Mercury. 8 = 1 eq. Oxygen. 40 = 1 eq. Sulphuric Acid.

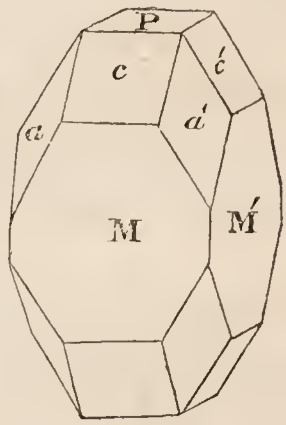
60 = 1 eq. Chloride of Sodium: 36 = 1 eq. Chlorine. 24 = 1 eq. Sodium.

8 = 1 eq. *Oxygen.*

32 = 1 eq. *Soda.*

72 = 1 eq. *Sulphate of Soda.*

Properties.—Chloride, or as it is denominated when a pointed distinction is necessary, *protochloride* of mercury, is commonly called calomel. It is a white semitransparent crystalline mass, inodorous, insipid, and insoluble in water. Its specific gravity is 7·175: by long exposure to light it is rendered of a dark colour, owing to partial decomposition. Occasionally perfect crystals are obtained, in which, although there does not appear to be any distinct cleavage, there are indications of it parallel to all the planes of a *square prism*, and this may be regarded as the primary form.



P on M, or M′	90° 00′
P on *a*	112 5
P on *c*	119 50
M on M′	90 00
M on *c*	150 10

Composition.—Chloride of Mercury is composed of

One equivalent of Chlorine	36	or 16
One equivalent of Mercury	202	„ 84
Equivalent	238.	100·

Symbol,—Berzelius and Turner.... Hg Cl.

Brande .... $(hg + c)$.

Impurities and Tests.—See Notes: HYDRARGYRI CHLORIDUM.

Incompatibles.—Chloride of mercury is immediately, at least partially, decomposed by ammonia; by potash, soda, and lime, protoxide of mercury being precipitated; carbonate of ammonia also produces decomposition, but the carbonates of potash and soda act less rapidly; bicarbonate of potash does not decompose it at all. By nitric acid it is partially converted into bichloride. It is decomposed by iron, copper and lead, and also by hydrosulphuric acid and its salts.

Pharmacopœia Preparation.—Pilulæ Hydrargyri Chloridi Compositæ.

Pharmacopœia Use.—Hydrargyri Oxydum.

Medicinal Uses.—It is an extremely efficient purgative, and it is alterative, antisyphilitic, and a valuable remedy in obstructions and hepatic affections. It is particularly useful in the diseases of children, and they frequently bear larger doses of it than adults. Dose as an alterative gr. ss. to gr. j. night and morning; as a purgative from gr. ij. to gr. x., or in some cases considerably more. Its insolubility and great specific gravity prevent its being eligibly exhibited in any other form than that of powder or pill.

HYDRARGYRI AMMONIO-CHLORIDUM.

Ammonio-chloride of Mercury.

Mercurius Præcipitatus Albus, P.L. 1746.
Calx Hydrargyri Alba, P.L. 1788.
Hydrargyrus Præcipitatus Albus, P.L. 1809.
Hydrargyrum Præcipitatum Album, P.L. 1809, edit. alt., P.L. 1824.

Take of Bichloride of Mercury six ounces,
Distilled Water six pints,
Solution of Ammonia eight fluidounces;

Dissolve the Bichloride of Mercury, with the application of heat, in the Water. To this when it is cold add the Solution of Ammonia, frequently stirring. Wash the powder thrown down until it is free from taste, lastly, dry it.

Remarks.—In former Pharmacopœias this preparation was obtained by the addition of solution of carbonate of potash and hydrochlorate of ammonia to that of the bichloride of mercury; the more direct method of employing solution of ammonia is now substituted.

Process.—When ammonia is added to bichloride of mercury, it appears, from the experiments of Dr. Kane, that half the chlorine is separated, and the whole of the mercury thrown down, combined, consequently, with only so much chlorine as reduces it to the state of protochloride, and this is united with ammonia.

Composition.—Various statements have been made on this subject. Dr. Kane considers it as constituted of bichloride and binamide of mercury; he admits, however, that it may contain oxygen; and adopting this latter opinion, I am disposed to consider this preparation as containing

One equivalent of Bichloride of Mercury ..	274
One equivalent of Binoxide of Mercury....	218
Two equivalents of Ammonia	34
Equivalent......	526.

If this be correct, the changes which occur are the following: When 2 eqs. of bichloride of mercury are dissolved in water, and ammonia is added to the solution, 2 eqs. of water are decomposed, the 2 eqs. of hydrogen of which unite with the 2 eqs. of chlorine of one of the equivalents of bichloride of mercury, and form 2 eqs. of hydrochloric acid, and these combining with 2 eqs. of ammonia give 2 eqs. of hydrochlorate of ammonia, which are poured off in the supernatant liquor. The 2 eqs. of oxygen of the 2 eqs. of decomposed water unite with the 1 eq. of mercury, separated from the 2 eqs. of chlorine, and form 1 eq. of binoxide of mercury, which is precipitated with the 1 eq. of bichloride of mercury undecomposed, and 2 eqs. of ammonia, forming the Hydrargyri Ammonio-chloridum.

2 eqs. *Hydrochlorate of Ammonia.*

2 eqs. Ammonia.
2 eqs. *Hydrochloric Acid.*

1 eq. Bichloride of Mercury. { 2 eqs. Chlorine. / 1 eq. Mercury.

2 eqs. Water. { 2 eqs. Hydrogen. / 2 eqs. Oxygen.

1 eq. *Binoxide of Mercury.*
1 eq. Bichloride of Mercury.
2 eqs. Ammonia.

Hydrargyri Ammonio-chloridum, P.L.

It may also be regarded as constituted of

One equivalent of Bichloride of Mercury	274
One equivalent of Binammoniuret of Binoxide of Mercury	252
Equivalent......	526

Properties.—This is a light and perfectly white powder. It is inodorous, insipid, and insoluble in water, but dissolved by sulphuric, nitric, and hydrochloric acid. When heated in solution of potash it suffers partial decomposition, becomes yellow, and yields ammonia.

Impurities and Tests.—See Notes: HYDRARGYRI AMMONIO-CHLORIDUM.

Medicinal Use.—It is employed only externally in cutaneous affections.

Pharmacopœia Preparation.—Unguentum Hydrargyri Ammonio-chloridi.

HYDRARGYRI OXYDUM.

Oxide of Mercury.

Hydrargyri Oxydum Cinereum, P.L. 1809, P.L. 1824.

Take of Chloride of Mercury an ounce,
Lime-water a gallon;

Mix and frequently shake them. Set by, and when the Oxide has subsided, pour off the liquor. Lastly, wash it in distilled Water until nothing alkaline can be perceived, and dry it, wrapped in bibulous paper, in the air.

Process.—When chloride of mercury is acted upon by lime, both suffer decomposition. The chlorine of the chloride unites with the calcium of the lime, and chloride of calcium is formed, which remains dissolved in the water, and is eventually poured away with it. The oxygen of the lime combining with the mercury forms oxide of mercury, which is precipitated.

Chloride of Calcium.

Chloride of Mercury.	Chlorine.	Calcium.	Lime.
	Mercury.	Oxygen.	

Oxide of Mercury.

Properties.—This preparation is nearly black, insoluble in water and the alkalis, but dissolves readily in nitric acid; it

decomposes and is decomposed by hydrochloric acid, which reconverts it to chloride of mercury, with the formation of water. It is totally volatilized by heat.

Composition.—It is composed of

One equivalent of Oxygen	8	or	3·8
One equivalent of Mercury	202	„	96·2
Equivalent	210.		100·

Symbol,—Berzelius and Turner .... Hg O.
Brande .... $(hg+o)$.

Impurities and Tests.—See Notes: HYDRARGYRI OXYDUM.

Incompatibles.—Acids. Acidulous Salts. Hydrosulphuric Acid and Hydrosulphates.

Medicinal Use.—Alterative. Dose, gr. j. to gr. iij. in the form of pill twice a day.

HYDRARGYRI BINOXYDUM.

Binoxide of Mercury.

Mercurius Calcinatus, P.L. 1746.
Hydrargyrus Calcinatus, P.L. 1788.
Hydrargyri Oxydum Rubrum, P.L. 1809, P.L. 1824.

Take of Bichloride of Mercury four ounces,
Solution of Potash twenty-eight fluidounces,
Distilled Water six pints;

Dissolve the Bichloride of Mercury in the Water; strain and add the solution of Potash. The liquor being poured off, wash, in distilled Water, the powder thrown down, until nothing alkaline can be perceived, and dry it with a gentle heat.

Remarks.—In former Pharmacopœias, binoxide of mercury was prepared by the slow operation of heat and air, and though similar in composition, was very different in appearance, from that obtained by the present process.

Process.—When bichloride of mercury is mixed with solution of potash, both are decomposed; the 2 equivalents of chlorine, which the bichloride contains, take 2 eqs. of potassium from the potash, and 2 eqs. of chloride of potassium are formed and remain dissolved; the 2 eqs. of oxygen separated from the potassium combine with the 1 eq. of mercury, and are precipitated together as binoxide of mercury.

2 eqs. *Chloride of Potassium.*

1 equiv. Bichloride of Mercury.

2 eqs. Chlorine.	2 eqs. Potassium.
1 eq. Mercury.	2 eqs. Oxygen.

2 eqs. Potash.

1 eq. *Binoxide of Mercury.*

Properties.—Binoxide of Mercury, as above prepared, is an orange-red powder; it is inodorous, acrid to the taste, and insoluble in water. At a heat below redness it is decomposed, yielding oxygen gas, and the mercury returns to the metallic state. It is readily dissolved by the nitric, hydrochloric, and some other acids. If it be of a brownish colour it is owing to the presence of oxichloride of mercury, and consequently the solution of potash employed was either too weak or deficient in quantity.

Composition.—Binoxide of Mercury is composed of

Two equivalents of Oxygen	16	or	7·3
One equivalent of Mercury	202	„	92·7
Equivalent	218.		100·

Symbol,—Berzelius and Turner .... Hg O^2.
Brande .... $(hg + 2o)$.

Impurities and Tests.—See Notes: HYDRARGYRI BINOXYDUM.

Incompatibles.—Acids and acidulous salts. Hydrosulphuric acid and hydrosulphates.

Medicinal Uses.—It is a very active medicine; but as it frequently occasions vomiting, purging, and sometimes affects the stomach and bowels violently, it is now but little employed. Dose, gr. j. combined with gr. ss. of opium.

Pharmacopœia Use.—Hydrargyri Bicyanidum.

HYDRARGYRI NITRICO-OXYDUM.

Nitric-oxide of Mercury.

Mercurius Præcipitatus Corrosivus, P.L. 1721.
Mercurius Corrosivus Ruber, P.L. 1746.
Hydrargyrus Nitratus Ruber, P.L. 1788.
Hydrargyri Nitrico-oxydum, P.L. 1809, P.L. 1824.

Take of Mercury three pounds,
Nitric Acid a pound and a half,
Distilled Water two pints;

Mix them in a proper vessel and apply a gentle heat until the Mercury is dissolved. Boil down the liquor, and rub what remains to powder. Put this into another very shallow vessel; then apply a slow fire, and gradually increase it until red vapour ceases to arise.

Process.—When the mercury is dissolved in the dilute nitric acid, part of the acid is decomposed into nitric oxide gas and oxygen. If the operation be performed in an open vessel, the nitric oxide gas combines with the oxygen of the atmospheric air to form nitrous acid gas, while the azotic gas of the air is left unacted upon. The oxygen of the decomposed nitric acid combines with the mercury to form oxide or protoxide of mercury, which the undecomposed nitric acid unites with to form protonitrate of mercury, and this is by evaporation reduced to dryness.

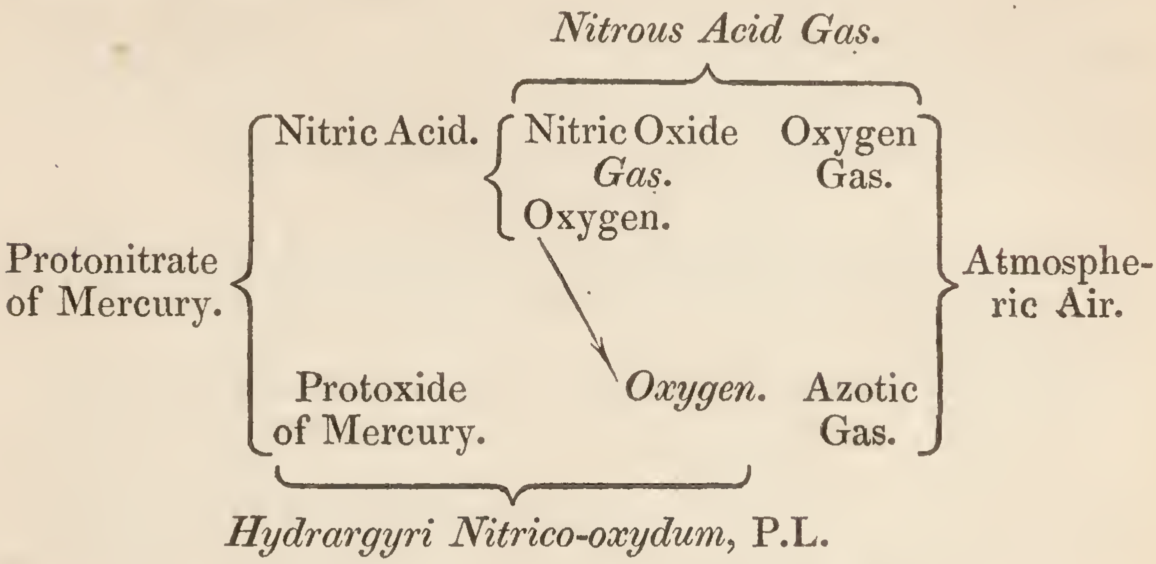
Nitrous Acid Gas.

Nitric Acid (*decomposed*). — Nitric Oxide *Gas*. Oxygen Gas. — Atmospheric Air.
Oxygen. Azotic Gas.
Mercury.
(*undecomposed*) — *Protoxide of Mercury.*
Nitric Acid.

Protonitrate of Mercury.

When this protonitrate of mercury is heated in an open vessel it is decomposed; the nitric acid is separated into nitric oxide

gas, which, as above shown, unites with the oxygen of atmospheric air to form nitrous acid gas, and leaves the azotic gas unacted upon. The oxygen of the decomposed nitric acid combines with the protoxide of mercury from which the nitric acid is expelled, and they form binoxide of mercury, the Hydrargyri Nitrico-oxydum, P.L.



Properties.—This preparation is of a bright red colour, and has a crystalline appearance; it sometimes contains a little undecomposed nitrate, and has on this account been called, but improperly, subnitrate of mercury. Except a small and accidental portion of undecomposed nitrate, it consists of the same quantities of oxygen and mercury as the last preparation; its symbols and incompatibles are, therefore, similar.

Impurities and Tests.—See Notes: HYDRARGYRI NITRICO-OXYDUM.

Pharmacopœia Preparation.—Unguentum Hydrargyri Nitrico-oxydi.

Medicinal Use.—It is employed only externally as an escharotic.

HYDRARGYRI BICYANIDUM.

Bicyanide of Mercury.

Take of Percyanide of Iron eight ounces,
Binoxide of Mercury ten ounces,
Distilled Water four pints;

Boil them together for half an hour, and strain. Eva-

porate the liquor that crystals may be formed. Wash what remains frequently with boiling distilled Water, and again evaporate the mixed liquors that crystals may be formed.

Bicyanide of Mercury may be otherwise prepared by adding as much Binoxide of Mercury as will accurately saturate it, to Hydrocyanic Acid distilled from Ferrocyanide of Potassium with diluted Sulphuric Acid.

Remarks.—Percyanide of Iron, usually called Prussian Blue, and hypothetically termed Ferrosesquicyanide of Iron, is in fact a compound of

Nine equivalents of Cyanogen	$26 \times 9 = 234$	or 54·4
Seven equivalents of Iron	$28 \times 7 = 196$	„ 45·6
Equivalent	430.	100·

It is prepared on the large scale as a pigment by adding the ferrocyanide of potassium already mentioned (see Hydrocyanic Acid) to a solution of sulphate of iron, and it is the result of a very complicated play of affinities, in which the oxygen of the air acts an important part. The results are that 6 equivalents of potassium, which 3 equivalents of ferrocyanide of potassium contain, are replaced by 4 equivalents of iron; and hence the composition of Prussian Blue as above stated.

Process.—When percyanide of iron and binoxide of mercury are boiled together in water, they act upon each other, though neither of them is soluble in it. The reactions which occur in preparing this compound are, that the cyanogen quits the iron to combine with the mercury, forming bicyanide of mercury, which is dissolved; on the other hand, the iron left by the cyanogen takes the oxygen which the mercury has quitted, and forms with it a mixture of protoxide and sesquioxide of iron, which remains insoluble.

Bicyanide of Mercury.

Percyanide of Iron.	Cyanogen.	Mercury.	Binoxide of Mercury.
	Iron.	Oxygen.	

Protoxide and *Sesquioxide of Iron.*

In the second method mentioned for preparing bicyanide of mercury, the changes are between hydrocyanic acid and binoxide

of mercury; two equivalents of the acid decompose one equivalent of the oxide, and the results are bicyanide of mercury and water.

	Water.		
Hydrocyanic Acid.	Hydrogen.	Oxygen.	Binoxide of Mercury.
	Cyanogen.	Mercury.	
	Bicyanide of Mercury.		

Properties.—The solution of bicyanide of mercury is colourless, and by evaporation yields colourless crystals, the form of which is a right square prism, with numerous modifying planes.

Fig. 1. represents the prism with the modifying planes which have been observed on two or three crystals only, out of a considerable number that have been examined.

Their general form is that shown in fig. 2, in which two of the planes a alternately efface all the other terminal planes at the two extremities of the prism. There are also many crystals which nearly resemble fig. 2, but in which the planes a and a'' are visible, although very minute. This irregularity of form is of the same character as belongs to sulphate of magnesia. The measured angles are as follows:

M on M′	90°	00′
c on M; c' on M′	132	45
a on M; a' on M, or M′	112	40
a' on a'''	114	00

Fig. 1.

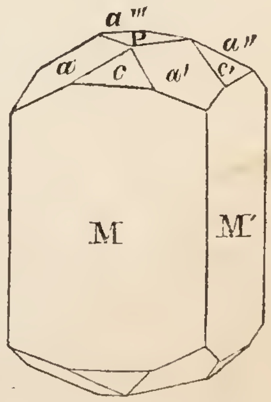
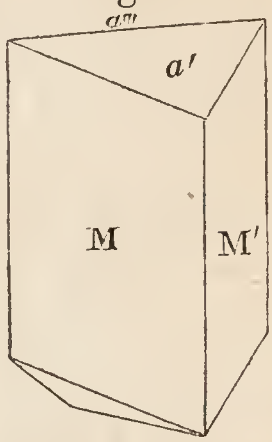


Fig. 2.



This salt has a metallic taste, is poisonous, much more soluble in hot water than in cold, and but sparingly soluble in alcohol. It is decomposed by heat, the results being cyanogen and mercury. It is dissolved by nitric acid without decomposition, but it is decomposed by sulphuric acid, and also by hydrochloric acid, which evolves hydrocyanic acid, with the formation of bichloride of mercury; the affinity existing between cyanogen and mercury is so strong, that the alkalis do not decompose the aqueous solution; but hydrosulphuric acid and the hydrosulphates readily produce this effect.

Composition.—Bicyanide of Mercury consists of

Two equivalents of Cyanogen ...	$26 \times 2 = 52$	or	20·4
One equivalent of Mercury	202	„	79·6
Equivalent......	254.		100·

Symbol,—Berzelius and Turner.... Hg Cy^2.
Brande .... $(hg + 2cy)$.

Impurities and Tests.—See Notes: Hydrargyri Bicyanidum.

Incompatibles.—Sulphuric Acid, Hydrochloric Acid, Hydrosulphuric Acid, Sulphurets and Hydrosulphates. It is sometimes employed in preparing hydrocyanic acid, and especially when required highly concentrated.

HYDRARGYRI IODIDUM.

Iodide of Mercury.

Take of Mercury an ounce,
Iodine five drachms,
Alcohol as much as may be sufficient;

Rub the Mercury and Iodine together, adding the alcohol gradually, until globules are no longer visible. Dry the powder immediately, with a gentle heat, without the access of light, and keep in a well-stopped vessel.

Properties.—This compound is a greenish-yellow powder; it is devoid of smell, and insoluble in water. It should not be exposed to light, as by its action, and also by that of heat, it is apt to be resolved into mercury and biniodide; when quickly heated, however, it sublimes nearly or quite unaltered.

Composition.—Iodide of Mercury is composed of

One equivalent of Iodine	126	or	38·4
One equivalent of Mercury	202	„	61·6
Equivalent........	328.		100·

Symbol,—Berzelius and Turner ...... Hg I.
Brande .... $(hg + i)$.

Impurities and Tests.—See Notes: Hydrargyri Iodidum.

Pharmacopœia Preparations.—Pilulæ Hydrargyri Iodidi, Unguentum Hydrargyri Iodidi.

Medicinal Uses.—It has been given internally in scrofulous habits, from gr. j. to gr. iij.; but it is chiefly employed in the form of ointment.

HYDRARGYRI BINIODIDUM.

Biniodide of Mercury.

Take of Mercury an ounce,
Iodine ten drachms,
Alcohol as much as may be sufficient;

Rub the Mercury and Iodine together, adding the Alcohol gradually, until globules are no longer visible. Dry the powder with a gentle heat, and keep it in a well-stopped vessel.

Properties.—The Biniodide of Mercury is of a red colour approaching to scarlet; it fuses readily, and sublimes in rhombic scales, which are yellow at first, but become red on cooling. It is not dissolved by water. It is soluble in some acids, and in alcohol also when heated.

Composition.—This salt consists of

Two equivalents of Iodine....	$126 \times 2 = 252$	or	55·5
One equivalent of Mercury............	202	„	44·5
Equivalent....	454.		100·

Symbol,—Berzelius and Turner........ Hg I^2.
Brande .... $(hg+2i)$.

Impurities and Tests.—See Notes: HYDRARGYRI BINIODIDUM.

Pharmacopœia Preparation.—Unguentum Hydrargyri Biniodidi.

Medicinal Uses.—Like the preceding, it has been tried in scrofulous and syphilitic affections in doses of gr. ss. to gr. j. daily; likewise as an ointment.

HYDRARGYRI BISULPHURETUM.

Bisulphuret of Mercury.

Cinnabaris Factitia, P.L. 1746.
Hydrargyrus Sulphuratus Ruber, P.L. 1788.
Hydrargyri Sulphuretum Rubrum, P.L. 1809, P.L. 1824.

Take of Mercury two pounds,
Sulphur five ounces;

Mix the Mercury with the Sulphur melted over the fire, and, as soon as the mass swells, remove the vessel from the fire, and cover it strongly lest inflammation should occur; then rub [the mass] to powder and sublime it.

Process.—By the action of heat in the first instance, combination takes place between the mercury and a portion of the sulphur; by continuing it, the excess of the latter appears to be expelled, and by sublimation, the red, per- or bi-sulphuret of mercury is obtained.

Properties.—In mass, this substance is of a dark colour, but when reduced to fine powder, it is of a brilliant red, and is often called cinnabar or vermilion. It is inodorous and insipid; insoluble in water, and unalterable by exposure to the combined action of air and moisture. When heated to redness in an open vessel, the sulphur is converted into sulphurous acid, and the mercury escapes in vapour. It is decomposed when distilled with lime, potash, or soda, and also by several of the metals.

When it is heated with sulphuric acid, sulphurous acid is evolved and a sulphate of mercury is formed. It is insoluble in nitric or hydrochloric acid; but when they are mixed, the chlorine evolved acts upon and decomposes the bisulphuret even without the assistance of heat.

Composition.—Bisulphuret of Mercury consists of

Two equivalents of Sulphur	$16 \times 2 =$	32	or 13·6
One equivalent of Mercury		202	,, 86·4
Equivalent....		234.	100·

Symbol,—Berzelius and Turner ...... Hg S^2.
Brande .... $(hg + 2s)$.

Impurities and Tests.—See Notes: HYDRARGYRI BISULPHURETUM.

Medicinal Uses.—It is employed for the purpose of mercurial fumigations by heating ʒss. of it on a red hot iron.

HYDRARGYRI SULPHURETUM CUM SULPHURE.

Sulphuret of Mercury with Sulphur.

Æthiops Mineralis, P.L. 1721, P.L. 1746.
Hydrargyrus cum Sulphure, P.L. 1788.
Hydrargyri Sulphuretum Nigrum, P.L. 1809, edit. alt., P.L. 1824.

Take of Mercury,
Sulphur, each a pound;

Rub them together, until globules are no longer visible.

Process.—The mercury combines with a portion of the sulphur by mere trituration; according to Mr. Brande, (Manual of Pharmacy, p. 303,) when Hydrargyri Sulphuretum cum Sulphure is boiled in a solution of potash, the excess of sulphur is removed, and a black insoluble powder remains, which when washed and dried is not acted upon by nitric acid, sublimes at a red heat without decomposition, and assumes the characters of the Hydrargyri Bisulphuretum.

Properties.—This preparation, well known by the name of Æthiops mineral, is a very black, insipid, and inodorous powder.

Composition.—It follows from what has been stated, that Hydrargyri Sulphuretum cum Sulphure is a mixture of

Bisulphuret of Mercury	58
Sulphur	42
	100.

Medicinal Uses.—It is an inefficient preparation. Dose, from gr. v. to gr. xxx. as an alterative.

PRÆPARATA EX MAGNESIO.
PREPARATIONS OF MAGNESIUM.

MAGNESIA.
Magnesia.

Magnesia Usta, P.L. 1788.
Magnesia, P.L. 1809, P.L. 1824.

Take of Carbonate of Magnesia four ounces;
Burn it for two hours in a very strong fire.

Remarks.—Magnesium is a peculiar metal, of which the alkaline earthy substance Magnesia, is the only well-known oxide, consisting of

One equivalent of Oxygen	8	or 40
One equivalent of Magnesium	12	„ 60
Equivalent....	20.	100·

Process.—The Carbonate of Magnesia, like the carbonate of lime, parts with its carbonic acid at a high temperature, and the magnesia remains pure.

Properties.—Colourless, inodorous, and tasteless if pure; it does not, like lime, become hot when mixed with water; it is very nearly insoluble in water, and although the moistened earth exhibits alkaline properties by turning vegetable blues green, and yellows brown, yet water in which it has been agitated does not dissolve enough to produce this effect, as lime-water readily does. By exposure to the air it slowly attracts carbonic acid and is reconverted to carbonate. It combines readily with acids to form salts.

Symbol,—Berzelius and Turner...... MgO.
Brande .... $(mag+o)$ or M.

Impurities and Tests.—See Notes: MAGNESIA.

Incompatibles.—Acids, Acidulous Salts, Metallic Salts, and Hydrochlorate of Ammonia.

Pharmacopœia Uses.—Strychnia, Veratria.

Medicinal Uses.—Antacid, and when acidity prevails, pur-

gative; it is preferable to the carbonate whenever the bowels are distended with flatus; in other respects its virtues are the same. Dose, ʒss. to ʒj.

MAGNESIÆ CARBONAS.

Carbonate of Magnesia.

Magnesia Alba, P.L. 1788.
Magnesiæ Carbonas, P.L. 1809.
Magnesiæ Subcarbonas, P.L. 1824.

Take of Sulphate of Magnesia four pounds,
Carbonate of Soda four pounds and eight ounces,
Distilled Water four gallons;

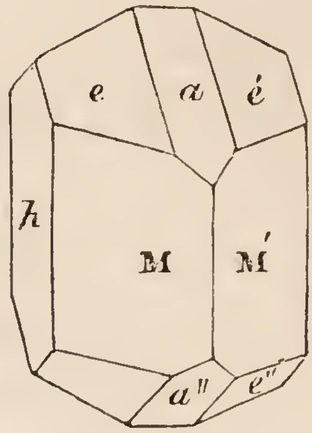
Dissolve separately the Carbonate of Soda and Sulphate of Magnesia in two gallons of the Water, and strain; then mix and boil the liquors, stirring constantly with a spatula for a quarter of an hour; lastly, the liquor being poured off, wash the precipitated powder with boiling distilled Water, and dry it.

Remarks.—Although Sulphate of Magnesia is an article of the Materia Medica, I shall take this opportunity of stating its qualities, crystalline form, and composition. It was originally called Epsom Salt, having been procured from a spring at that place.

Sulphate of Magnesia is one of the saline ingredients of sea-water, and for a long time it was procured only from the bittern remaining after the preparation of common salt; thus obtained it was generally mixed with so considerable a quantity of chloride of magnesium, that owing to the deliquescent property of this salt, the sulphate was usually damp. It has since been much better prepared from magnesian limestone, by a very ingenious process, invented by the late Dr. Henry, and the salt so formed being unmixed with chloride of magnesium, does not attract moisture from the air.

Sulphate of Magnesia crystallizes with great readiness, and although the crystals are usually small, they may be obtained of considerable size by slowly cooling the solution. The primary form of this substance may be regarded as a *right prism* with a *rhombic base,* whose angles are 90° 30′ and 89° 30′.

Fig. 1.



There is only one cleavage, which is parallel to the short diagonal of the prism, and consequently to the plane *h* of the accompanying figures.

Fig. 1. represents a crystal of a form which frequently occurs, and of which the following are the measurements:

M on M′ (primary) ..	90° 30′
M on *h*	134 45
M on *e*	129 00
a on *a′*	120 nearly.

Fig. 2.

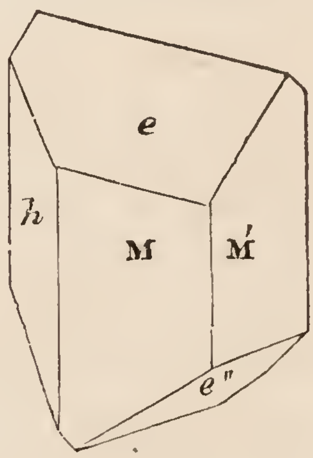


Fig. 2. represents a form in which the crystals also frequently appear; in this form only two of the four planes *e* are seen on each summit, and alternating in position as shown in the figure.

On some of the crystals, however, which resemble this figure, the two other planes *e* may be perceived, but they are very minute.

Sulphate of Magnesia is an extremely bitter salt; it is readily soluble in cold water, and still more so in hot water, the former dissolving an equal weight, and the latter one-third more; it slowly effloresces by exposure to the air, and when heated it loses its water of crystallization.

Composition.—Sulphate of Magnesia is composed of

One equivalent of Sulphuric Acid	40	or 32·52
One equivalent of Magnesia	20	„ 16·26
Seven equivalents of Water...... 9×7=	63	„ 51·22
Equivalent	123.	100·

Symbol,—Berzelius and Turner .. MgO, SO^3, 7HO.
Brande.............. $(M+S'+7q)$.

Incompatibles.—This salt is incompatible with the alkalis potash and soda, and their carbonates, but the bicarbonates and sesquicarbonates do not decompose it until part of the carbonic acid is expelled by heat. Ammonia decomposes it but partially, and the sesquicarbonate not at all. Lime-water and chloride of calcium are both incompatible with this salt, and so also are the acetates of lead.

Medicinal Use.—Sulphate of Magnesia is extensively employed as a purgative. Dose, from ℥ss. to ℥jss.

Preparation of Carbonate of Magnesia.—The process of preparing carbonate of magnesia, from the sulphate, is one in which double decomposition takes place; the carbonic acid of the carbonate combines with the magnesia of the sulphate, and the carbonate of magnesia formed being insoluble in water, it is precipitated; the soda of the carbonate unites with the sulphuric acid of the sulphate of magnesia, and the resulting sulphate of soda remains in solution.

Sulphate of Soda.

Carbonate of Soda.	Soda.	Sulphuric Acid.	Sulphate of Magnesia.
	Carbonic Acid.	Magnesia.	

Carbonate of Magnesia.

The above diagram explains what happens in the first instance; but it will appear from what I shall presently state, that during the operations of washing and drying, one-fifth of the carbonic acid is replaced by water.

Properties.—Carbonate of Magnesia when pure is colourless, inodorous, tasteless, and unalterable in the air; it is insoluble in water; and is decomposed by a strong heat, which expels the carbonic acid.

Composition.—Carbonate of Magnesia is theoretically, or while moist, composed of

One equivalent of Carbonic Acid......	22	or	52·4
One equivalent of Magnesia...........	20	,,	47·6
Equivalent....	42.		100·

But according to Berzelius the common carbonate of magnesia of the shops consists of

Carbonic Acid	35·77
Magnesia	44·75
Water	19·48
	100·

My analysis of the Pharmacopœia preparation gave very nearly

Carbonic Acid	36·
Magnesia	40·8
Water	23·2
	100·

It is therefore probably a compound of

One equivalent of Bihydrated Magnesia	38
Four equivalents of Hydrated Carbonate of Magnesia .	204
	242

which will give in 100 parts

Carbonic Acid	36·3
Magnesia	41·3
Water	22·4
	100·

It appears, therefore, that when five equivalents of sulphate of magnesia are decomposed by carbonate of soda, four equivalents of the magnesia are converted into hydrated carbonate, and one equivalent, having its carbonic acid replaced by two equivalents of water, becomes bihydrate of magnesia.

Incompatibles.—Acids and acidulous and metallic salts, hydrochlorate of ammonia, and lime-water.

Pharmacopœia Preparation.—Magnesia.

Pharmacopœia Use.—In the extemporaneous preparation of distilled waters.

Medicinal Uses.—Antacid and purgative, and in lithic calculi in doses of ℈j. to ʒj.

PRÆPARATA È PLUMBO.

PREPARATIONS OF LEAD.

PLUMBI ACETAS.

Acetate of Lead.

Saccharum Saturni, P.L. 1721, P.L. 1746.
Cerussa Acetata, P.L. 1788.
Plumbi Superacetas, P.L. 1809.
Plumbi Acetas, P.L. 1824.

Take of Oxide of Lead, rubbed to powder, four pounds and two ounces,
Acetic Acid,
Distilled Water each four pints;

Mix the Acid with the Water, and add the Oxide of Lead to them, and a gentle heat being applied dissolve it: then strain. Lastly, evaporate the liquor that crystals may be formed.

Remarks.—Lead is a well-known, soft, bluish-white metal of sp. gr. 11·381. It may be made to combine with four different proportions of oxygen:

1st, *Dinoxide*, of a dark grey colour, composed of
One equivalent of oxygen $8 + 208$ two eqs. of lead $= 216$

2nd, *Oxide* or *Protoxide*, yellow, composed of
One equivalent of oxygen $8 + 104$ one eq. of lead $= 112$

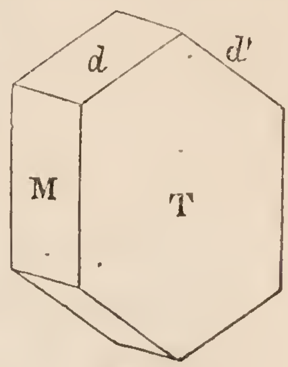
3rd, *Deutoxide*, red, composed of
Four equivalents of oxygen $32 + 312$ three eqs. of lead $= 344$

4th, *Binoxide* or *Peroxide*, brown, composed of
Two equivalents of oxygen $16 + 104$ one eq. of lead $= 120$

Of these the oxide or protoxide only combines with acids to form salts; when prepared by heating lead exposed to the air in the process of making red lead, it has a pale yellow colour, and is called in commerce *massicot*; while *litharge*, which is the oxide directed by the College, is obtained during the separation of silver from lead ore, and having undergone partial fusion and crystallization, it has a different appearance from massicot, though its composition is similar.

Process.—This is a case of single affinity merely; the solution is colourless, and by evaporation yields crystals of acetate of lead.

Properties.—Acetate of Lead is crystalline, colourless, nearly inodorous, of a sweetish astringent taste, and is poisonous; it suffers but little change by exposure to the air. The crystals are usually very small; but if they are suffered to form slowly, they may be obtained of considerable size. Their primary form appears to be *a right oblique-angled prism*; the only modification which it has been as yet observed to present, is exhibited in the annexed figure:—



d on d'	128°	0'
d on M	116	0
d on T	98	30
M on T	109	32

Water at 60° dissolves about one-fourth of its weight of this salt, and it is not much more soluble in boiling water. When the solution is exposed to the air, the acetate is partly decomposed by the absorption of carbonic acid, and carbonate of lead is precipitated; water which contains carbonic acid also decomposes acetate of lead to a certain extent; and if a current of carbonic acid gas be passed through the solution, one half of the acetate is converted into carbonate and precipitated, and binacetate of lead remains in solution.

Composition.—Acetate of Lead is composed of

One equivalent of Acetic Acid	51	or	26·8
One equivalent of Oxide of Lead	112	,,	58·9
Three equivalents of Water ....9 × 3 =	27	,,	14·3
Equivalent....	190.		100·

Symbol,—Berzelius and Turner ...... $PbO, H^3C^4O^3, 3HO$.
Brande.................. $(\mathrm{Pl} + ac' + 3q)$.

Impurities and Tests.—See Notes: PLUMBI ACETAS.

Incompatibles.—It is decomposed by all those acids and their compounds which form, with oxide of lead, salts nearly insoluble in water, as the sulphuric, hydrochloric, carbonic, citric, and

tartaric acids, &c. It is decomposed by lime-water; by the alkalis potash and soda; but, if added in excess, they redissolve the precipitate at first formed. Hard water usually contains three ingredients which decompose acetate of lead, viz. carbonate of lime, sulphate of lime, and common salt; and hence when dissolved in such water, the solution is always turbid. It is decomposed by hydrosulphuric acid and its salts, which give a black sulphuret: Liquor Ammoniæ Acetatis also decomposes it, on account of the carbonic acid diffused through it.

Pharmacopœia Preparations.—Ceratum Plumbi Acetatis, Liquor Plumbi Diacetatis, Plumbi Chloridum, Plumbi Iodidum.

Medicinal Uses.—It is principally employed externally, in solution in water, as a collyrium in ophthalmia, an astringent in gonorrhœa, and as a wash in external inflammation. Internally it is given cautiously, and combined with opium, in protracted diarrhœa, and in pulmonary and intestinal hæmorrhage. Dose, gr. ss. to gr. j.

LIQUOR PLUMBI DIACETATIS.

Solution of Diacetate of Lead.

Aqua Lithargyri Acetati, P.L. 1788.
Liquor Plumbi Acetatis, P.L. 1809.
Liquor Plumbi Subacetatis, P.L. 1809, edit. alt., P.L. 1824.

Take of Acetate of Lead two pounds and three ounces,
Oxide of Lead, rubbed to powder, one pound and four ounces,
Water six pints;

Boil them for half an hour, frequently stirring, and when the liquor is cold, add of distilled Water as much as may be sufficient to measure with it six pints; lastly, strain [the solution].

Process.—It has been already mentioned that acetate of lead is a salt, composed of one equivalent each of acid and oxide; but acetic acid is capable of combining with it an additional equivalent of oxide of lead, by which it becomes a compound of one equivalent of acid and two equivalents of base, forming a subsalt called a *diacetate*.

$$\overbrace{\text{1 equiv. Acetic Acid} + \text{1 equiv. Oxide of Lead.}}^{\text{1 equiv. Acetate of Lead.}}$$

1 equiv. *Oxide of Lead.*

$$\underbrace{\qquad\qquad\qquad\qquad\qquad\qquad}$$

1 equiv. *Diacetate of Lead*=1 eq. Acid+2 eqs. Oxide.

Properties.—This preparation is colourless; it has an astringent sweetish taste; its specific gravity is 1·260. It is decomposed by hard water, for reasons which have been already stated with respect to acetate of lead, and the quantity of insoluble salt formed is much larger; distilled water, which contains the smallest portion of carbonic acid, also decomposes this solution. This preparation is very often improperly made with the residue of the distillation of vinegar; it has then a very dark colour, and ought to be rejected.

Composition.—This solution, as its name imports, contains diacetate of lead, composed of

One equivalent of Acetic Acid	51	or 18·5
Two equivalents of Oxide of Lead .. 112×2=	224	„ 81·5
Equivalent	275·	100·

Symbol,—Berzelius and Turner.... $2PbO, H^3 C^4 O^3$.
Brande .... $(2\text{Pl} + ac')$.

Incompatibles.—Similar to those which are such with the acetate of lead.

Pharmacopœia Preparations.—Ceratum Plumbi Compositum, Liquor Plumbi Diacetatis Dilutus, Plumbi Oxydum Hydratum.

Medicinal Uses.—External in superficial and phlegmonic inflammations of the skin.

LIQUOR PLUMBI DIACETATIS DILUTUS.

Diluted Solution of Diacetate of Lead.

Aqua Lithargyri Acetati Composita, P.L. 1788.
Liquor Plumbi Acetatis Dilutus, P.L. 1809.
Liquor Plumbi Subacetatis Dilutus, P.L. 1809, edit. alt., P.L. 1824.

Take of Solution of Diacetate of Lead a fluidrachm and a half,
Distilled Water a pint,
Proof Spirit two fluidrachms;
Mix.

Medicinal Use.—Employed as an application in superficial inflammation.

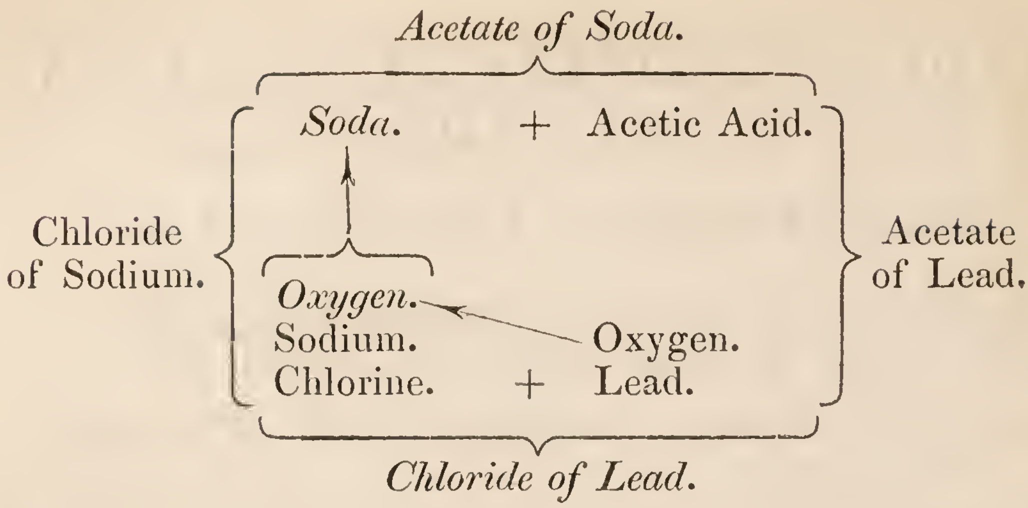
PLUMBI CHLORIDUM.

Chloride of Lead.

Take of Acetate of Lead nineteen ounces,
Distilled Water, boiling, three pints,
Chloride of Sodium six ounces;

Dissolve the Acetate of Lead and Chloride of Sodium separately, the former in three pints of distilled Water, and the latter in one pint of distilled Water. Then the liquors being mixed together, wash what is precipitated with distilled Water, when it is cold, and dry it.

Process.—When these solutions are mixed, the chloride of sodium and acetate of lead are both decomposed, and the results are acetate of soda, which remains in solution, and chloride of lead, which is precipitated; and this is accompanied with, and dependent upon, the transfer of the oxygen of the oxide of lead to the sodium of the chloride :—



I have lately found, however, that the decomposition is not complete ; a double salt is formed, the nature of which I have not yet examined, but which is to a considerable extent soluble in water. Hydrochloric acid occasions the precipitation of more chloride of lead after the action of the chloride of sodium is over.

Properties.—This compound is colourless, fusible, and on cooling after fusion assumes a horn-like appearance, and hence was formerly called *horn lead.* It dissolves in 30 parts of water at 60° and in 22 at 212°, separating, as the solution cools, in small, flat, prismatic, anhydrous crystals, which have frequently much brilliancy. It is more soluble in water containing a little nitric acid. The solution is decomposed by the alkalis, but potash and soda in excess redissolve the precipitate ; the alkaline carbonates throw down carbonate of lead.

Composition.—Chloride of Lead consists of

One equivalent of Chlorine	36	or	25·7
One equivalent of Lead	104	,,	74·3
Equivalent......	140.		100·

Symbol,—Berzelius and Turner .... Pb Cl.
Brande ....(pl+c).

Pharmacopœia Use.—Morphiæ Hydrochloras.

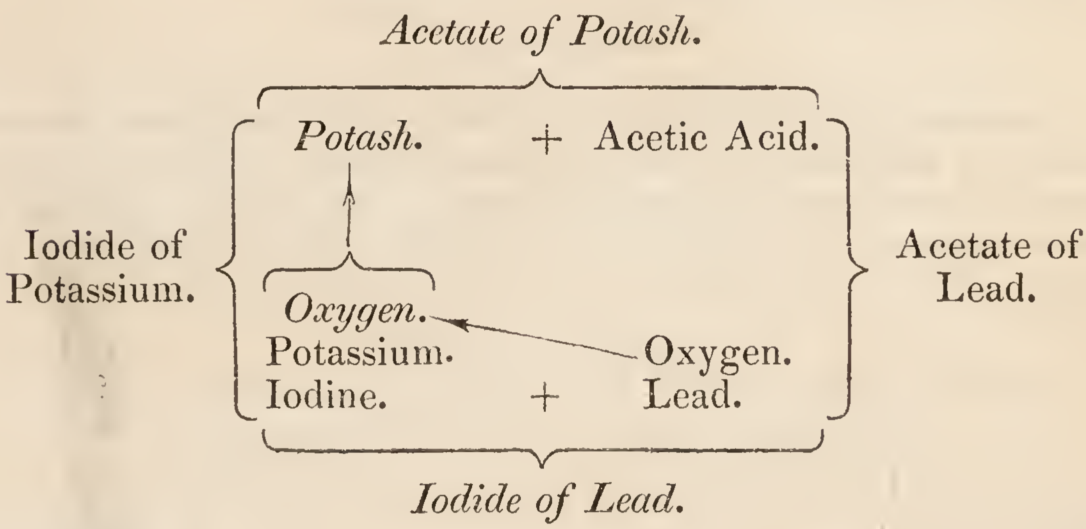
PLUMBI IODIDUM.

Iodide of Lead.

Take of Acetate of Lead nine ounces,
Iodide of Potassium seven ounces,
Distilled Water a gallon ;

Dissolve the Acetate of Lead in six pints of the Water and strain; and to these add the Iodide of Potassium first dissolved in two pints of the Water. Wash what is precipitated, and dry it.

Process.—The properties of iodide of potassium will be presently stated; when it is mixed with a solution of acetate of lead both are decomposed, accompanied with the transfer of the oxygen of the oxide of lead to the potassium of the iodide, and there are formed acetate of potash, which remains dissolved, and iodide of lead, which is precipitated:—



Properties.—Iodide of Lead is of a yellow colour; it is very sparingly soluble in cold water, but dissolves in larger quantity in boiling water; and on cooling, shining yellow minute crystalline scales are deposited. It is soluble in solution of potash; and is decomposed and volatilized by heat.

Composition.—Iodide of Lead is composed of

One equivalent of Iodine	126	or 54·78
One equivalent of Lead	104	„ 45·22
Equivalent....	230.	100·

Symbol,—Berzelius and Turner .. Pb I.
Brande .... $(pl+i)$.

Impurities and Tests.—See Notes: PLUMBI IODIDUM.

Pharmacopœia Preparation.—Unguentum Plumbi Iodidi.

Medicinal Uses.—In indolent swellings it has been given in doses of a quarter to half a grain; the ointment being used at the same time.

PLUMBI OXYDUM HYDRATUM.

Hydrated Oxide of Lead.

Take of Solution of Diacetate of Lead six pints,
Distilled Water three gallons,
Solution of Potash six pints, or as much as may be sufficient to precipitate the Oxide;

Mix. Wash with water what is precipitated until nothing alkaline remains.

Process.—This is a case of single elective affinity and decomposition; the oxide of lead combines however with some water, which constitutes it a hydrated oxide; this being insoluble is thrown down, and the acetate of potash formed remains in solution.

	Acetate of Potash.		
Diacetate of Lead.	Acetic Acid.	Potash.	Solution of Potash.
	Oxide of Lead.	Water.	
	Hydrated Oxide of Lead.		

Properties.—Hydrated Oxide of Lead is a perfectly white powder; it is soluble in excess of potash, and therefore in preparing it care should be taken not to employ too much of the alkaline solution. It is also soluble in nitric acid: with hydrochloric acid it forms chloride of lead, and with the sulphuric an insoluble sulphate. It is blackened by hydrosulphuric acid and its salts.

Composition.—It consists of the protoxide of lead combined with water in proportions which have not been determined; its white colour is dependent upon the presence of the water.

Pharmacopœia Use.—It is employed in preparing the Disulphate of Quina.

PRÆPARATA È POTASSIO.

PREPARATIONS OF POTASSIUM.

POTASSÆ CARBONAS.

Carbonate of Potash.

Sal Absinthii. Sal Tartari, &c. P.L. 1721.
Sal Absinthii. Sal Tartari, P.L. 1746.
Kali Præparatum, P.L. 1788.
Potassæ Subcarbonas, P.L. 1809, P.L. 1824.

Take of impure Carbonate of Potash two pounds,
Distilled Water a pint and a half;

Dissolve the impure Carbonate of Potash in the Water, and strain; then pour it into a proper vessel, and evaporate the Water, that the Liquor may thicken; afterwards stir it constantly with a spatula until the salt concretes.

Carbonate of Potash may be prepared more pure from the crystals of Bicarbonate of Potash heated to redness.

Remarks.—Potash is the protoxide of the metal Potassium discovered by Davy in 1807. This metal is white and bright, readily tarnishes and oxidizes by exposure to moist air. The specific gravity is 0·865; its affinity for oxygen is so great, that it not only combines with it at common temperatures, but even decomposes water, and unites with its oxygen so rapidly as to occasion vivid combustion. There are two oxides, of which the oxide or protoxide only, and which is usually called *potash*, combines with acids to form salts; the peroxide is decomposed even by the action of water; this separates it into oxygen, which is evolved in the state of gas, and protoxide of potassium or potash, which it dissolves.

These oxides are composed of

Oxide, Protoxide, or *Potash,*	One eq. of Oxygen....	8	or 16·7
	One eq. of Potassium..	40	„ 83·3
	Equivalent....	48.	100·

Peroxide,	Three equivalents of Oxygen ....$8 \times 3 =$	24	or 37·5
	One equivalent of Potassium	40	„ 62·5
	Equivalent....	64.	100·

Process.—Impure Carbonate of Potash is the *Pearlash* of commerce: this consists of the carbonate mixed with various saline and some earthy substances. By solution in water the greater portion of the earthy impurity, at least, is removed, and it is better to employ cold water than the hot, formerly directed by the College, and the quantity is advantageously diminished.

Properties.—This salt is colourless and inodorous; its taste is strong and disagreeable; it does not readily crystallize, and is never kept in crystals; it is deliquescent, attracting in a short time enough water from the atmosphere to become fluid; water dissolves rather more than an equal weight of it, and any residue may be considered as impurity. The solution turns vegetable blues green, and yellows brown; it is insoluble in alcohol. When heated to redness it loses about 16 per cent. of water.

Composition.—This salt is composed of

One equivalent of Carbonic Acid......	22	or 31·43
One equivalent of Potash............	48	„ 68·57
Equivalent..	70.	100·

The Pharmacopœia preparation is a sesquihydrate, consisting of

One equivalent of Carbonate of Potash .	70·0	or 84
One and a half equivalent of Water....	13·5	„ 16
Equivalent....	83·5.	100·

As this salt contains one equivalent of its constituent acid and base, its proper appellation is carbonate of potash, that now given it by the College: it was formerly called *subcarbonate* of potash, because it not only acts like an alkali in rendering vegetable yellows brown, and blues green, but on account of its power of combining with an additional quantity of carbonic acid.

Symbol,—Berzelius and Turner.. KO, CO^2, $1\frac{1}{2}$ HO.
Brande .... $(P + car' + 1\frac{1}{2}q)$.

Impurities and Tests.—See Notes: POTASSÆ CARBONAS.

Incompatibles.—Acids and acidulous salts, acetate of ammonia, alum, chloride of barium, chloride of calcium, hydrochlorate of ammonia, lime-water, sulphate of magnesia, and most other salts, whether alkaline, earthy, or metallic.

Pharmacopœia Preparations.—Decoctum Aloës Compositum, Enema Aloës, Liquor Potassæ, Liquor Potassæ Arsenitis, Liquor Potassæ Carbonatis, Mistura Ferri Composita, Potassæ Acetas, Potassæ Bicarbonas, Potassæ Tartras, Potassii Bromidum, Potassii Iodidum, Potassii Sulphuretum.

Pharmacopœia Uses.—Æther Sulphuricus, Spiritus Ammoniæ, Spiritus Ammoniæ Aromaticus, Spiritus Ammoniæ Fœtidus.

Medicinal Uses.—Antacid and diuretic. Dose from gr. x. to gr. xxx. It is much employed as an ingredient in saline draughts.

LIQUOR POTASSÆ CARBONATIS.

Solution of Carbonate of Potash.

Liquamen Tartari seu *Oleum Tartari per Deliquum*, P.L. 1721.
Lixivium Tartari, P.L. 1746.
Aqua Kali, P.L. 1788.
Aqua Kali Præparati, P.L. 1788, edit. alt.
Liquor Potassæ Subcarbonatis, P.L. 1809, P.L. 1824.

Take of Carbonate of Potash twenty ounces,
Distilled Water a pint;
Dissolve the Carbonate of Potash in the Water, and strain.

Properties.—This solution is colourless, inodorous, and possesses the other properties above mentioned. Its specific gravity is 1·473. Dose, from ♏x. to f℥j.

POTASSÆ BICARBONAS.

Bicarbonate of Potash.

Potassæ Carbonas, P.L. 1809, P.L. 1824.

Take of Carbonate of Potash six pounds,
Distilled Water a gallon;

Dissolve the Carbonate of Potash in the Water; afterwards pass Carbonic Acid through the solution to saturation. Apply a gentle heat, so that whatever crystals have been formed may be redissolved. Then set aside [the solution] that crystals may be again produced; the liquor being poured off, dry them.

Carbonic Acid is very easily obtained from Chalk rubbed to powder and mixed with water to the consistence of a syrup, upon which Sulphuric Acid is then poured diluted with an equal weight of Water.

Process.—It has been mentioned that Carbonate of Potash, as indeed its name indicates, is composed of one equivalent each of acid and alkali; the object of the present process is to add another equivalent of carbonic acid, and thus to form Bicarbonate of Potash. Chalk, or carbonate of lime, is composed of one equivalent of carbonic acid and one of lime. When sulphuric acid is added to the carbonate of lime, it is decomposed by the superior affinity of the sulphuric acid for the lime; and the carbonic acid evolved in the gaseous state, being passed into the solution of carbonate of potash, combines with and converts it into bicarbonate, while sulphate of lime remains in the vessel in which the sulphuric acid is poured upon the chalk.

Bicarbonate of Potash = 2 eqs. Acid + 1 eq. Potash.

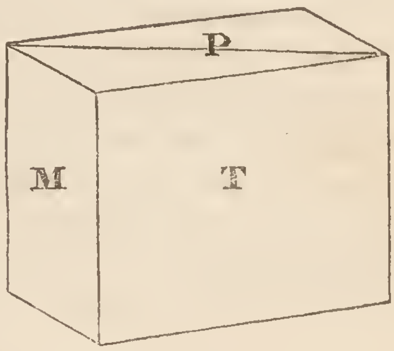
Carbonate of Lime.	Carbonic Acid, 1 eq.	Carbonate of Potash, 1 eq. Acid + 1 eq. Potash.
	Lime, 1 eq.	Sulphuric Acid.

Sulphate of Lime.

Properties.—This salt is inodorous, colourless, and crystalline. When properly prepared it has scarcely any alkaline taste, and acts but slightly, if at all, upon turmeric paper. It suffers no change by exposure to the air. It requires four times its weight of water at 60° for solution; by boiling water it is partially decomposed, and rendered more soluble by the loss of carbonic acid. It is insoluble in alcohol. When exposed to a low red heat it loses half its carbonic acid, the whole of its water of crystallization, and returns to the state of carbonate; and this is the method of procuring the latter in a state of purity now adopted by the College, as already seen.

The primary form of this substance is *a right oblique-angled prism*, which is not readily traced in the secondary crystals, but may be derived from cleavage, and is shown in fig. 1. There is also a cleavage parallel to a plane passing through the diagonal marked on the terminal planes.

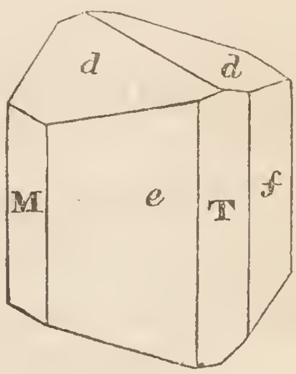
Fig. 1.



P on M, or T..........	90° 00′
M on the diagonal plane.	53 15
M on T	103 25

The planes which appear on the crystals are represented in fig. 2; but the planes *e* are sometimes very disproportionately extended, so as nearly to efface T and *f*, giving to the crystals the character of another primary form.

Fig. 2.



The planes T do not commonly occur on the crystals, and without these they nearly resemble a secondary form of the *right rhombic prism*; they may, however, be distinguished by the unequal inclination of M on the two adjacent planes. On cleaving or otherwise breaking the crystal, water may be observed between the laminæ, which probably occasions the measurement on the cleavage planes not accurately to agree. This is also the case with many other of the factitious salts.

M on plane parallel to *f*............	127° 35′
M on *e*	126 45
T on *e*.........................	156 50
T on *f*.........................	128 50
e on *f*.........................	105 40
M on *d*.........................	111 00
d on *d′*	138 00

Composition.—This salt consists of

Two equivalents of Carbonic Acid ..	$22 \times 2 = 44$	or	43·56
One equivalent of Potash..........	48	,,	47·53
One equivalent of Water	9	,,	8·91
Equivalent..	101.		100·

Symbol,—Berzelius and Turner.... $KO, 2CO^2, HO$.
Brande .... $(P + 2car' + q)$.

Impurities and Tests.—See Notes: POTASSÆ BICARBONAS.

Incompatibles.—These are nearly the same as enumerated when treating of carbonate of potash. It does not, however, produce any precipitate in a solution of sulphate of magnesia; and chloride of mercury is not at all decomposed by it.

Pharmacopœia Preparations.—Liquor Potassæ Effervescens, Potassæ Carbonas.

Medicinal Uses.—In cases where an alkali is indicated, this preparation offers an agreeable and efficient remedy; and experience has shown that its additional proportion of carbonic acid does not in the least invalidate its alkaline agency. Dose, grs. x. to grs. xxx.

LIQUOR POTASSÆ EFFERVESCENS.

Effervescing Solution of Potash.

Take of Bicarbonate of Potash a drachm,
Distilled Water a pint;

Dissolve the Bicarbonate of Potash in the Water; and pass into it of Carbonic Acid, compressed by force, more than sufficient for saturation. Keep the Solution in a well-stopped vessel.

Remarks.—The carbonic acid gas may be procured in the mode already stated. It is intended by the excess of carbonic acid to render the medicine less disagreeable, and this is probably effected without diminishing its power. It is not to be regarded as a definite compound, but as a definite salt, mixed with excess of carbonic acid.

LIQUOR POTASSÆ.

Solution of Potash.

Lixivium Saponarium, P.L. 1746.
Aqua Kali Puri, P.L. 1788.
Liquor Potassæ, P.L. 1809, P.L. 1824.

Take of Carbonate of Potash fifteen ounces,
Lime eight ounces,
Distilled Water, boiling, a gallon;

Dissolve the Carbonate of Potash in half a gallon of the water. Sprinkle a little of the Water upon the lime in an earthen vessel, and the lime being slacked, add the rest of the water. The liquors being immediately mixed together in a close vessel, shake them frequently until they are cold. Then set by [the mixture], that the Carbonate of Lime may subside. Lastly, keep the supernatant liquor, when poured off, in a well-stopped green glass bottle.

Process.—This is a case of single elective affinity and decomposition: the lime has a strong affinity for the carbonic acid which has been expelled from it by heat; and when it is mixed with the carbonate of potash, owing to the greater affinity existing between the earth and the acid, than between the alkali and the acid, the carbonate of potash is decomposed; the carbonate of lime formed is precipitated, and the potash remains in solution, forming the Liquor Potassæ.

Solution of Potash.

Solution of Carbonate of Potash.
Water.
Potash.
Carbonic Acid. Lime.

Carbonate of Lime.

Properties.—Solution of Potash is limpid, colourless, and inodorous; its taste is extremely acrid and caustic; and, when

rubbed between the fingers, it feels soapy, in consequence of a partial solution of the cuticle. Its specific gravity is 1·063. It should be carefully preserved from contact with the air, in order to prevent the absorption of carbonic acid; and as it is apt to act upon and destroy flint glass, the College have advantageously ordered it to be kept in green glass bottles.

Impurities and Tests.—See Notes: POTASSÆ LIQUOR.

Incompatibles.—Acids, acidulous salts, sesquicarbonate, acetate and hydrochlorate of ammonia, preparations of metals and earths held in solution by acids; chloride and bichloride of mercury.

Pharmacopœia Preparation.—Potassæ Hydras.

Pharmacopœia Uses.—Antimonii Oxysulphuretum, Ferri Potassio-tartras, Hydrargyri Binoxydum, Oleum Æthereum, Plumbi Oxydum Hydratum.

Medicinal Uses.—Antacid, diuretic, alterative, and lithontriptic; it has also been found useful in some cutaneous diseases, as in lepra, psoriasis, &c. Dose ♏x. to f℥ss. It is recommended to give it in veal broth or in table beer: the latter is said to disguise its nauseous flavour completely. Care, however, ought to be taken that the beer is not sour.

POTASSÆ HYDRAS.

Hydrate of Potash.

Lapis Infernalis sive *Septicus*, P.L. 1721.
Kali Purum, P.L. 1788.
Potassa Fusa, P.L. 1809, P.L. 1824.

Take of Solution of Potash a gallon;

Evaporate the water in a clean iron vessel over the fire, until, the ebullition being finished, the Hydrate of Potash liquefies; pour this into proper moulds.

Properties.—Hydrate of Potash is a compound of potash and water; when pure it is white, hard and brittle, but as usually prepared for medicinal purposes, it contains the various slight impurities of the solution, and frequently peroxide of iron, acquired during evaporation. It is generally of a brownish and sometimes of a bluish tint, is extremely caustic, and very deliquescent, attracting water and carbonic acid from the atmosphere; water dissolves nearly an equal weight of it, and during solution heat is extricated.

Unlike the carbonate and bicarbonate of potash, it dissolves readily in alcohol. It possesses in the strongest degree the properties denominated alkaline.

Hydrate of potash melts when exposed to a low red heat; but so great is the affinity existing between the potash and the water, that although they may be evaporated together at a white heat, the water cannot be separated by it. During the preparation of the hydrate of potash a portion of the potash becomes peroxide of potassium; but the additional oxygen thus acquired is expelled in the gaseous state, during solution in water.

Composition.—This preparation consists of

One equivalent of Potash	48	or	84·2
One equivalent of Water	9	„	15·8
Equivalent....	57.		100·

Symbol,—Berzelius and Turner.... KO, HO.
Brande .... $(P+q)$.

Incompatibles.—See Potassæ Liquor.

Pharmacopœia Preparation.—Potassa cum Calce.

Medicinal Uses.—Potassæ Hydras is used only externally as a caustic; except for particular purposes, the Argenti Nitras is generally preferred; for, on account of the deliquescent property of the hydrate of potash, it is difficult to confine its action within the requisite limits.

POTASSA CUM CALCE.

Potash with Lime.

Causticum Commune Fortius, P.L. 1746.
Calx cum Kali Puro, P.L. 1788.
Potassa cum Calce, P.L. 1809, P.L. 1824.

Take of Hydrate of Potash,
Lime, each an ounce;

Rub them together and keep them in a well-stopped vessel.

Remarks.—The method of using this is to mix it into a paste with a little spirit of wine, and apply it to the part to be cauterized.

POTASSÆ ACETAS.

Acetate of Potash.

Sal Diureticus, P.L. 1746.
Kali Acetatum, P.L. 1788.
Potassæ Acetas, P.L. 1809, P.L. 1824.

Take of Carbonate of Potash a pound,
Acetic Acid twenty-six fluidounces,
Distilled Water twelve fluidounces;

Add the Carbonate of Potash to the Acid first mixed with the water, to saturation, then strain. Evaporate the liquor in a sand-bath, the heat being cautiously applied, until the salt is dried.

Process.—In this operation the carbonic acid of the carbonate is expelled in the gaseous state on account of the more powerful affinity existing between acetic acid and potash, than between carbonic acid and potash.

Properties.—Acetate of Potash thus obtained is a colourless pulverulent salt; it is nearly inodorous, and has a pungent saline taste; it is extremely deliquescent, very soluble in water, and is dissolved also by alcohol; it is decomposed by a red heat and converted into carbonate of potash. As usually prepared it has a foliated appearance, which is given to it by fusion and cooling; in this operation however, unless very carefully conducted, the acetate is liable to be decomposed.

Composition.—Acetate of Potash consists of

One equivalent of Acetic Acid......	51	or 51·5
One equivalent of Potash	48	,, 48·5
	99.	100·

Symbol,—Berzelius and Turner.. $KO, H^3C^4O^3$.
Brande .... $(P + ac')$.

Impurities and Tests.—See Notes: Potassæ Acetas.

Incompatibles.—It is decomposed by the sulphuric, nitric, and hydrochloric acids, the acetic acid being expelled. It is also decomposed by sulphate of soda and sulphate of magnesia, and by several other earthy and metallic salts.

Medicinal Uses.—In small doses it is diuretic, and in larger ones mildly cathartic. Dose as a diuretic from ℈j. to ʒi.; as a cathartic from ʒij. to ʒiij. As it is deliquescent, it must be exhibited in solution.

POTASSÆ SULPHAS.

Sulphate of Potash.

Tartarum Vitriolatum, P.L. 1721.
Tartarum Vitriolatum. Nitrum Vitriolatum, P.L. 1746.
Kali Vitriolatum, P.L. 1788.
Potassæ Sulphas, P.L. 1809, P.L. 1824.

Take of the Salt which remains after the distillation of Nitric Acid two pounds,
Water, boiling, two gallons;

Ignite the Salt in a crucible until the excess of Sulphuric Acid is entirely expelled, then boil it in the two gallons of Water until a pellicle floats, and the liquor being strained, set it aside that crystals may be formed. The liquor being poured off, dry them.

Process.—It has been already explained that the salt remaining after the distillation of nitric acid is composed of bisulphate of potash and water; the excess of acid is now economically directed to be expelled by heat instead of, as formerly, saturated by the addition of carbonate of potash.

Properties.—This salt is colourless, inodorous, bitter and rather hard; water at 60° dissolves only one-sixteenth of its weight, but boiling water a much larger quantity; it is insoluble in alcohol. It suffers no change by exposure to the air. When subjected to a strong heat it merely decrepitates, losing but little weight, for it contains no water of crystallization.

The primary form of this salt is a *right rhombic prism*; M M′ and P are primary planes.

Fig. 1.

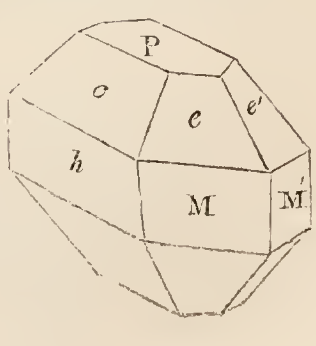


Fig. 1. is a single modified crystal.

M on M′	120° 30′
M on *h*	120 45
M on *e*	146 22
h on *e*	146 10
e on *e*′	131 12

Fig. 2.

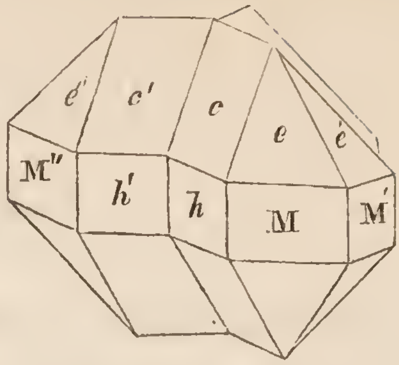


Fig. 2. is the compound crystal, which consists of three single crystals, so united that their upper edges meet at angles of 120°, and consequently the planes of junction incline to each other at the same angle. Hence

M on M″ .... 119° 30′
e on *e*″ 130 24

Fig. 3.

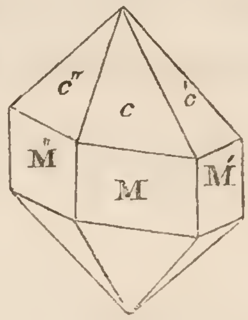


Fig. 3. is one of the common bi-pyramidal crystals, whose relation to the preceding figures may be perceived from the corresponding letters on the planes.

The union of these three crystals takes place at an angle of 120°.

Composition.—This salt is composed of

One equivalent of Sulphuric Acid......	40	or	45·45
One equivalent of Potash	48	,,	54·55
Equivalent	88.		100·

Symbol,—Berzelius and Turner.... KO, SO^3.
Brande .... (P+*S*′).

Impurities and Tests.—See Notes: POTASSÆ SULPHAS.

Adulteration.—This salt is so extremely cheap, and in its crystalline state any mixture would be so obvious, that adulteration is hardly to be suspected. It may, however, be observed, that the solution should produce no change in the colour of litmus or turmeric paper; no precipitate with solution of sulphate of silver, nor any upon the addition of ammonia or its sesquicarbonate.

Incompatibles.—The solution of this salt is decomposed by tartaric acid, which forms crystals of bitartrate of potash; by chloride of barium, barytes water, and chloride of calcium, but not by lime-water, as has been asserted; it also decomposes the solutions of acetate and diacetate of lead.

Pharmacopœia Preparation.—Pulvis Ipecacuanhæ Compositus.

Medicinal Uses.—It should be exhibited in the form of powder, in conjunction with rhubarb or some other purgative medicine. On account of its hardness it is an eligible substance for triturating with other bodies and dividing powders; with this intention it enters into the composition of Pulvis Ipecacuanhæ Compositus. Dose, gr. x. to ʒss.

POTASSÆ BISULPHAS.

Bisulphate of Potash.

Potassæ Supersulphas, P.L. 1809, P.L. 1824.

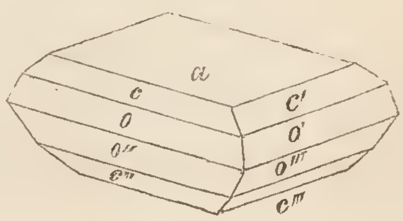
Take of the Salt which remains after the distillation of Nitric Acid two pounds,
Sulphuric Acid a pound,
Water, boiling, six pints;

Dissolve the Salt in the Water, and add the Acid to it, and mix. Lastly, boil down, and set aside [the solution], that crystals may be formed.

Process.—When the salt remaining after the distillation of nitric acid, which is bisulphate of potash, is dissolved in water, and the solution is allowed to crystallize, it occasionally happens that some sulphate and sesquisulphate are mixed with the bisulphate, owing to the partition of the excess of sulphuric acid between the water and the sulphate of potash. This inconvenience is remedied by the addition of sulphuric acid now directed to be employed.

Properties.—This salt is colourless, inodorous, and extremely acid and bitter; it is very soluble in water, the solution acts strongly upon vegetable blue colours, and decomposes the alkaline, earthy, and metallic carbonates with effervescence. By a red heat the water of crystallization and half the acid are expelled, and common sulphate of potash remains. The primary form of the crystal of this salt is a *right rhombic prism.* There appears to be but one cleavage, namely, parallel to the plane *a*. The crystal is often much flatter than the sketch.

a on c or c'	135° 0′
— o or o'	108 30
c on c'	125 10
o on o'	103 52
o on o''	142 44



Composition.—It is composed of

Two equivalents of Sulphuric Acid	$40 \times 2 = 80$	or 54·80
One equivalent of Potash	48	,, 32·87
Two equivalents of Water	$9 \times 2 = 18$	,, 12·33
Equivalent	146.	100·

Symbol,—Berzelius and Turner ...... $KO, 2SO^3, 2HO$.
Brande .... $(P+2S'+2q)$.

Incompatibles.—This salt is incompatible with alkalis, earths, and their carbonates; many metals and most oxides are acted upon by the excess of acid which it contains.

Medicinal Uses.—It is exhibited combined with other purgatives, especially with Rhubarb. Dose, gr. x. to ʒj.

POTASSÆ TARTRAS.

Tartrate of Potash.

Tartarum Solubile, P.L. 1746.
Kali Tartarizatum, P.L. 1788.
Potassæ Tartras, P.L. 1809, P.L. 1824.

Take of Bitartrate of Potash, powdered, three pounds,
Carbonate of Potash sixteen ounces, or as much as may be sufficient,
Water, boiling, six pints;

Dissolve the Carbonate of Potash in the boiling Water, then add the Bitartrate of Potash, and boil. Strain the liquor, and afterwards boil it down until a pellicle floats, and set it aside that crystals may be formed. The liquor being poured off, dry these, and again evaporate the liquor that crystals may be produced.

Process.—The nature and composition of both the salts employed in this formula have been stated; when they are made to act upon each other, the excess of tartaric acid in the bitartrate of potash combines with the potash of the carbonate and expels its carbonic acid in the gaseous state; so that one equivalent of each produces two equivalents of the neutral tartrate.

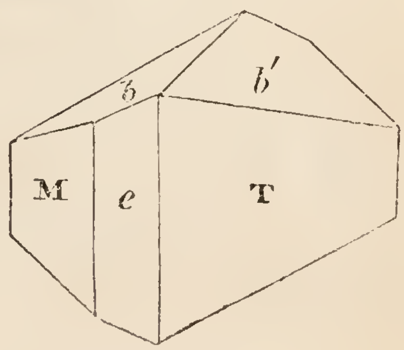
1 equiv. Bitartrate of Potash. $\left\{\begin{array}{l} \text{1 eq. Carbonic Acid } \textit{Gas.} \\ \\ \text{1 eq. Tartrate of Potash.} \\ \text{1 eq. Tartaric Acid.} \quad \text{1 eq. Potash.} \end{array}\right\}$ 1 equiv. Carbonate of Potash.

2 eqs. Tartrate of Potash.

This salt has a saline bitter taste; it is soluble in less than twice its weight of water, and hence its former name of *soluble tartar*, to distinguish it from common tartar, which is the bitartrate of potash; it is nearly insoluble in alcohol. In a damp atmosphere it attracts moisture; by a red heat it is decomposed and converted into carbonate of potash. It is commonly met with in the shops in the state of powder, but it ought always to be crystallized. When this salt has been properly prepared it does not alter either litmus or turmeric paper.

The primary form of tartrate of potash is a *right oblique-angled prism*, with cleavages parallel to the lateral planes.

M on T	89° 30′
M on *e*	142 13
M on *b*	107 30
T on *e*	127 17
T on *b′*	103 40



Composition—Tartrate of Potash consists of

One equivalent of Tartaric Acid	66	or 57·9
One equivalent of Potash..........	48	„ 42·1
Equivalent	114.	100·

Symbol,—Berzelius and Turner...... KO, $H^2 C^4 O^5$.

Brande .... ($tar' + P$).

Impurities and Tests.—See Notes: POTASSÆ TARTRAS.

Incompatibles.—Tartrate of Potash is decomposed by most acids, and many acidulous salts, for when added to a solution, they occasion the formation and crystallization of bitartrate of potash. It is decomposed by lime-water and chloride of calcium, and by solutions of lead and silver, &c.

Medicinal Uses.—It is a mild and efficient purgative, and when given with resinous purgatives or senna, it corrects their griping properties by accelerating their operation. Dose, ʒj. to ℥j. in solution.

POTASSII BROMIDUM.

Bromide of Potassium.

Take of Bromine two ounces,
Carbonate of Potash two ounces and one drachm,
Iron Filings an ounce,
Distilled Water three pints;

First add the Iron, and afterwards the Bromine, to a pint and a half of the distilled Water. Set them by for half an hour, frequently stirring them with a spatula. Apply a gentle heat, and when a greenish colour occurs, pour in the Carbonate of Potash dissolved in the remainder of the Water. Strain, and wash what remains in two pints of boiling distilled Water, and again strain. Let the mixed liquors be evaporated, so that crystals may be formed.

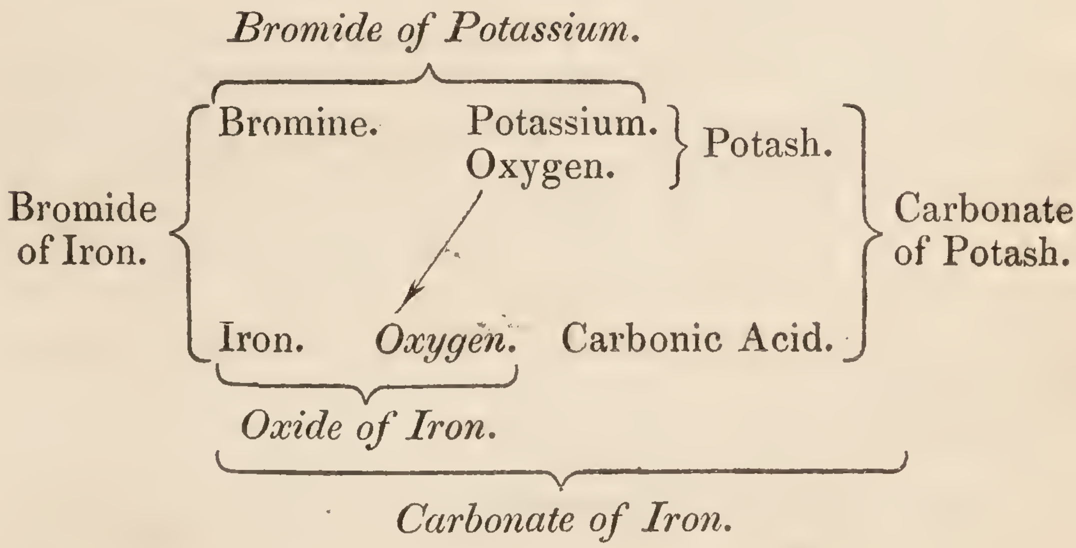
Remarks.—Bromine is an elementary fluid body, which was discovered by M. Balard in 1826. It exists in sea-water and some saline springs, combined probably with magnesium or sodium; but the quantity is so small that 100 pounds of sea-water yielded only $3\frac{1}{3}$ grains of bromine. It is separated by means of the greater affinity of chlorine for the base with which it is combined, and when set free it is dissolved by æther.

The properties of Bromine are, that at common temperatures it is a deep reddish-brown liquid, of a very disagreeable and suffocating odour; hence its name. Its specific gravity is about 3. At a little below 0° it becomes solid. It dissolves sparingly in water, but combines readily with alcohol. It is considerably volatile, for at average temperatures it emits a red-coloured vapour very similar in appearance to nitrous acid gas: if heated to about 116° it boils; and when passed through red-hot earthen tubes it suffers no alteration of properties, not being resolved into any simpler forms of matter. It is poisonous; its test is a solution of starch, to which it gives a yellowish tint.

It resembles Oxygen, Chlorine and Iodine in being elicited in electrical decomposition at the anode or positive pole of the voltaic

battery, and like them also it is a powerful supporter of combustion, some metals, as antimony, burning spontaneously when thrown upon it. In smell also it greatly resembles chlorine and iodine, but is much more powerful than either of them ; like them also it combines with oxygen and hydrogen, and forms bromic acid and hydrobromic acid.

Process for Bromide of Potassium.—Bromine unites with the metals by direct combination to form bromides, and it also acts upon their oxides ; the first step in this operation is to obtain bromide of iron ; when this is procured, it is decomposed by the carbonate of potash ; oxygen is transferred from the potash to the iron, and the oxide of iron formed uniting with the carbonic acid, is converted into carbonate of iron and precipitated, while the Bromide of Potassium remains in solution, and is by evaporation crystallized.



Bromide of Potassium may also be prepared, without the intervention of iron, by adding bromine to a solution of potash ; but, in this case, bromate of potash is necessarily produced with it. The reaction which occurs is as follows, six equivalents of each substance being necessary to the changes. Five eqs. of bromine decompose 5 eqs. of potash, and combine with the 5 eqs. of potassium to form 5 eqs. of bromide of potassium ; while the 5 eqs. of oxygen, yielded by the 5 eqs. of decomposed potash, unite with 1 eq. of bromine, and give 1 eq. of bromic acid, which combines with 1 eq. of potash to form 1 eq. of bromate of potash. So that the salt obtained in this mode consists of 5 eqs. of bromide of potassium and 1 eq. of bromate of potash.

When this mixture is strongly heated, the bromate of potash is converted into bromide of potassium, by the expulsion of oxygen in the gaseous state, on account of the decomposition both of the bromic acid and potash, 5 eqs. of oxygen being lost by the former, and 1 eq. by the latter : thus

6 equivs. *Oxygen Gas.*

1 equiv. Bromic Acid.	5 eqs. Oxygen.	1 eq. Oxygen.	1 equiv. Potash.
	1 eq. Bromine.	1 eq. Potassium.	

1 equiv. *Bromide of Potassium.*

When, however, bromide of potassium is prepared in this manner, care must be taken that too much heat be not employed in converting the bromate into bromide, otherwise loss may be incurred by vaporization.

Properties of Bromide of Potassium.—This salt is colourless and inodorous; it crystallizes in cubes or quadrangular prisms; the crystals contain no water: it has a penetrating taste, is very soluble in water, and more so in hot than cold; alcohol dissolves a little of it; it decrepitates when heated, and undergoes igneous fusion without suffering decomposition. If however it be very strongly heated with access of air, it is vaporized. It is decomposed by chlorine, which expels bromine, and chloride of potassium is formed.

Composition.—This salt consists of

One equivalent of Bromine	78	or	66·1
One equivalent of Potassium	40	„	33·9
Equivalent......	118.		100·

Symbol,—Berzelius and Turner	KBr.
Brande................	$(po+b)$.

Impurities and Tests.—See Notes: POTASSII BROMIDUM.

Incompatibles.—Acids, acidulous and metallic salts.

Medicinal Uses.—This salt has been successfully employed in cases of enlarged spleen by Dr. Williams, of St. Thomas's Hospital. Dose, from 3 to 10 grs. two or three times a day.

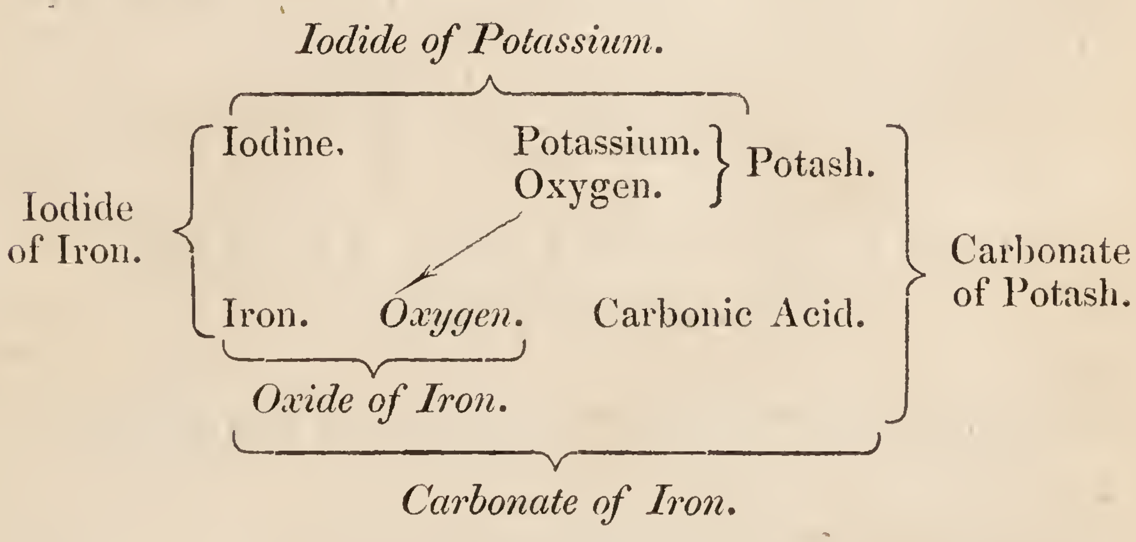
POTASSII IODIDUM.

Iodide of Potassium.

Take of Iodine six ounces,
Carbonate of Potash four ounces,
Iron Filings two ounces,
Distilled Water six pints ;

Mix the Iodine with four pints of the Water, and add the Iron, stirring them frequently with a spatula for half an hour. Apply a gentle heat, and when a greenish colour occurs, add the Carbonate of Potash, first dissolved in the two pints of Water, and strain. Wash what remains with two pints of boiling distilled water, and again strain. Let the mixed liquors be evaporated, so that crystals may be formed.

Process.—The action of Iodine upon metals and their oxides is perfectly analogous to that of bromine, already explained ; and it will be observed, that in the preparation of iodide of potassium, like that of the bromide, the first step is that of forming iodide of iron by direct combination ; this when obtained is decomposed by carbonate of potash.



Iodide of Potassium, like the bromide, may be prepared by means of potash without the intervention of iron, and a corresponding inconvenience occurs, viz. the formation of iodate of potash, requiring the application of a strong heat to reduce it

to the state of iodide of potassium. Substituting iodine for bromine, the diagrams already given will explain the changes which occur in the present case.

Properties.—Iodide of Potassium is colourless, inodorous, crystallizes in cubes, which contain no water; it has a penetrating taste. Water at 65° dissolves nearly one and a half time its weight; it is sparingly soluble in absolute alcohol, but more so in that which contains water. It fuses at a red heat, and at a very high temperature is volatilized, without suffering decomposition.

Composition.—This salt is composed of

One equivalent of Iodine	126	or	76
One equivalent of Potassium	40	,,	24
Equivalent......	166.		100

Symbol,—Berzelius and Turner .. KI.
Brande .... $(po+i)$.

Incompatibles.—Acids, Acidulous and Metallic Salts.

Pharmacopœia Preparations.—Liquor Potassii Iodidi Compositus, Tinctura Iodinii Composita, Unguentum Iodinii Compositum.

Pharmacopœia Use.—Plumbi Iodidum.

Medicinal Uses.—This is a most valuable medicine, for the introduction of which into this country we are indebted to Dr. Williams of St. Thomas's Hospital. It is but justice due to him to refer to an excellent paper read at one of the evening meetings of the College of Physicians, in which he has illustrated the medicinal properties of this salt in various forms of the secondary symptoms of syphilis. Dose, from gr. v. to gr. x. or more, two or three times a day.

LIQUOR POTASSII IODIDI COMPOSITUS.

Compound Solution of Iodide of Potassium.

Take of Iodide of Potassium ten grains,
Iodine five grains,
Distilled Water a pint;
Mix, that they may be dissolved.

Remarks.—In this mixture the iodide of potassium, by uniting with an additional portion of iodine, renders it soluble in water; it has been called *ioduretted iodide of potassium.* It is a brown-coloured solution, and has the peculiar smell and taste of iodine, and its reaction on starch.

Medicinal Uses.—This is another mode of exhibiting iodine, which has been found very serviceable in dispersing some forms of bronchocele. Dose, from f℈ss. to fʒss.; but its effects varying on different constitutions, its exhibition requires the exercise of great judgment.

POTASSII SULPHURETUM.

Sulphuret of Potassium.

Hepar Sulphuris, P.L. 1721.
Kali Sulphuratum, P.L. 1788.
Potassæ Sulphuretum, P.L. 1809, P.L. 1824.

Take of Sulphur an ounce,
Carbonate of Potash four ounces;
Rub them together, and place them upon the fire in a covered crucible, until they have united.

Remarks.—Sulphur is a well-known elementary or undecomposed body, which sometimes occurs in nature nearly pure, but more commonly in combination with the metals, forming sulphurets. The greater part of that which is used in the arts is the produce of volcanic countries. Its colour is yellow with a shade of green; it is nearly inodorous and tasteless, insoluble in water, and is with difficulty dissolved by spirit of wine. The sp. gr. of sulphur is about 2; at a moderate temperature it melts, and at a higher one is converted into vapour; it burns readily with a lambent blue flame, and suffocating vapours of sulphurous acid are formed by its combining with the oxygen of the air during combustion. When pure, or crystallized, it is frequently translucent. The primary form of the crystal is a right rhombic prism.

In commerce, the various kinds of sulphur are distinguished by the names of Crude Sulphur; Flowers of Sulphur (the Sul-

phur Sublimatum of the Pharmacopœia); and Roll Sulphur, prepared by melting crude sulphur, and pouring it while fluid into moulds.

Process.—When the requisite proportions of sulphur and carbonate of potash are heated together, the carbonic acid is expelled, and three-fourths of the potash (oxide of potassium) are decomposed; the oxygen of this proportion combines with part of the sulphur to form sulphuric acid, and this acid uniting with the one-fourth of undecomposed potash, sulphate of potash results. The potassium of the decomposed potash combines also with sulphur, and sulphuret of potassium is formed; so that when the operation has been properly conducted, the Potassii Sulphuretum of the Pharmacopœia is chiefly a compound of sulphuret of potassium and sulphate of potash. The peculiar properties of the preparation depend upon the sulphuret of potassium.

280 Carbonate of Potash.
- 88 Carbonic Acid *Gas.*
- 144 Potash = 24 *Oxygen* + 120 *Potassium.*
- 48 Potash — 16 Sulphur — 48 Sulphur.
- 16 Sulphur + 24 *Oxygen* = 40 *Sulph. Acid.* — 120 *Potassium* + 48 Sulphur = 168 *Sulphuret of Potassium.*
- 48 Potash + 40 *Sulph. Acid* = 88 *Sulphate of Potash.*
- 88 *Sulphate of Potash* + 168 *Sulphuret of Potassium* = *Potassii Sulphuretum.* P.L.

Composition.—It follows from what is above stated, that this preparation consists essentially of

Three eqs. of Sulphuret of Potassium	16+40 × 3	=168	or 65·6
One eq. of Sulphate of Potash......	40+48	= 88	,, 34·4
		256.	100·

Symbol,—Berzelius and Turner.. $3KS;\ KO,\ SO^3$.
Brande .... $3(po+s)+(P+s')$.

Properties.—This substance is hard; it is of a liver-brown colour, and hence its ancient name of Hepar Sulphuris. It is inodorous while dry, but when moistened it emits a smell of hydrosulphuric acid; it dissolves readily in water. Its taste is acrid and bitter. By exposure to the air this preparation is soon spoiled, for the sulphur and potassium both attracting oxygen, sulphate of potash is formed; it then becomes inodorous and white, and is totally unfit for use.

Incompatibles.—This compound is decomposed by acids, they expelling hydrosulphuric acid and precipitating sulphur. It is decomposed also by solutions of most of the metals, which,

uniting with the sulphur, are precipitated in the state of sulphuret.

Medicinal Uses.—It is principally used externally in cutaneous diseases, and has been recommended as a lotion for the itch in infants, and is stated to have succeeded after the sulphur ointment has failed. It is rarely used internally.

PRÆPARATA È SODIO.

PREPARATIONS OF SODIUM.

SODÆ CARBONAS.

Carbonate of Soda.

Natron Præparatum, P.L. 1788.
Sodæ Subcarbonas, P.L. 1809, P.L. 1824.

Take of Impure Carbonate of Soda two pounds,
Distilled Water four pints;

Boil the impure Carbonate of Soda in the Water, and strain it while hot. Lastly, set it by that crystals may be formed.

Remarks.—It has been already stated that Davy discovered potassium in 1807, and showed that potash was the oxide. In the same year he also proved that soda is the oxide of a metal which he named Sodium, very similar in many of its properties to potassium, and it may be procured from soda by processes analogous to those used for obtaining potassium from potash.

Sodium is a brilliant white metal; it is soft, malleable, and it tarnishes rapidly by exposure to moist air, owing to oxidizement. Its specific gravity is 0·972. It softens at 122°, fuses at about 190°, and at a white heat it is volatilized. It burns when heated in contact with air, and is converted to soda or oxide of sodium. Under particular circumstances it decomposes water with com-

bustion, as potassium does, but in general the action is accompanied merely by a hissing noise.

Sodium, like potassium, forms two compounds with oxygen. These oxides are composed of

Oxide, Protoxide or *Soda,*	One eq. of Oxygen	8	or 25
	One eq. of Sodium	24	„ 75
	Equivalent......	32.	100·

Peroxide or *Sesquioxide,*	One and a half eq. of Oxygen	12	or 33·3
	One eq. of Sodium	24	„ 66·6
	Equivalent......	36.	99·9

Hydrate of Soda is composed of

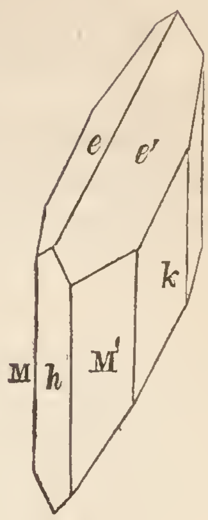
One equivalent of Water	9	or 21·9
One equivalent of Soda..............	32	„ 78·1
Equivalent....	41.	100·

Peroxide of Sodium is quite unimportant; it is decomposed by water, and forms no salts with acids.

Soda resembles potash in appearance and is obtained in the same way; it is best known in the state of hydrate, and procured, as hydrate of potash is, by evaporating a solution and igniting the residue. In medicine, however, it is not employed in a separate state.

Process.—Carbonate of Soda is a compound of carbonic acid and the alkali soda; this substance has been long known as the *fossil* or *mineral alkali* or *natron*; it occurs in various parts of the earth in the state of a peculiar carbonate. It is also obtained by burning certain plants and sea-weed, but is now generally prepared by the decomposition of common salt. The impure carbonate of soda formerly employed was *barilla,* procured by burning certain plants in Spain; there is, however, now prepared, and with greater economy, a much preferable, though still not quite pure, carbonate of soda. When this is dissolved in hot water to saturation, crystals are deposited, as the solution cools, which are carbonate of soda.

Fig. 1.

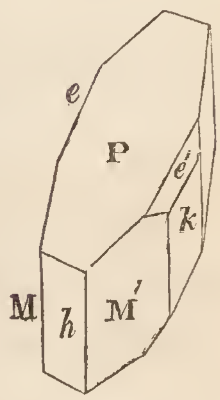


Properties.—The crystals of this salt are frequently very large, and are obtained for various uses of considerable purity; the primary form of the crystal appears to be an *oblique rhombic prism.*

This figure represents the ordinary shape of the crystals.

P on M, or M′	108° 43′
P on *e*, or *e*′	129 52
P on *h*	121 20
M on M	76 12
M on *h*	128 6
M on *k*	141 54
e on *e*′	79 44
e on *k*	143 8

Fig. 2.



The crystals represented by fig. 2. are reduced in height, and so thin as to leave scarcely a vestige of the planes M and *h*, and several are hemitropes, the plane of imaginary section being parallel to P.

Qualities.—Carbonate of Soda is colourless and inodorous; its taste is alkaline and disagreeable, but less so than that of carbonate of potash; the crystals contain a large quantity of water, the greater part of which they readily lose by exposure to the air, and at high temperatures the salt becomes fluid and boils. Water at 60° dissolves at least half its weight of carbonate of soda, and boiling water considerably more. The solution possesses the alkaline property of rendering vegetable yellows brown.

Composition.—Carbonate of Soda in the crystallized state consists of

One equivalent of Carbonic Acid	22	or 15·3
One equivalent of Soda	32	„ 22·2
Ten equivalents of Water	9 × 10 = 90	„ 62·5
Equivalent	144.	100·

		Soda.	Crystals of Carbonate of Soda.
Symbol,—	Berzelius and Turner	NaO.	NaO, CO^2, 10HO.
	Brande	(S.)	(S + *car*′ + 10*q*).

Tests and Impurities.—See Notes: Sodæ Carbonas.

Incompatibles.—This salt is incompatible with acids, acidulous salts, lime-water, hydrochlorate of ammonia, earthy and metallic salts.

Pharmacopœia Preparations.—Liquor Sodæ Chlorinatæ, Pilulæ Ferri Compositæ, Sodæ Carbonas Exsiccata, Sodæ Potassio-tartras, Sodæ Sesquicarbonas, Sodæ Sulphas.

Pharmacopœia Uses.—Ferri Sesquioxydum, Magnesiæ Carbonas.

Medicinal Uses.—These are similar to those of the carbonate of potash, but this salt is preferable as being more mild and less nauseous. Dose, from gr. x. to ʒss. twice or thrice a day.

SODÆ CARBONAS EXSICCATA.

Dried Carbonate of Soda.

Sodæ Subcarbonas Exsiccata, P.L. 1809, P.L. 1824.

Take of Carbonate of Soda a pound;

Apply heat to the Carbonate of Soda in a proper vessel, until it is dried, and afterwards heat it to redness. Lastly, rub it to powder.

Process.—The greater part of the water which crystallized carbonate of soda contains, is first expelled by a moderate degree of heat, and the total expulsion is effected by ignition; the first is applied, because the fused salt, if strongly heated, would boil over, and the ignition is requisite to render the preparation of uniform strength.

Composition.—It follows from what has been stated that this anhydrous salt consists of

One equivalent of Carbonic Acid........	22	or	40·7
One equivalent of Soda................	32	,,	59·3
Equivalent....	54.		100·

Symbol,—Berzelius and Turner .... NaO, CO^2.
Brande................. $(S + car')$.

Medicinal Use.—In this dry state carbonate of soda may be exhibited in the form of powder mixed with other medicines. Dose, gr. v. to gr. xv.

SODÆ SESQUICARBONAS.

Sesquicarbonate of Soda.

Sodæ Carbonas, P.L. 1809, P.L. 1824.

Take of Carbonate of Soda seven pounds,
Distilled Water a gallon;
Dissolve the Carbonate of Soda in the Water, and strain; then pass Carbonic Acid into the Solution to saturation that the Salt may subside. Dry this with a gentle heat, wrapped and pressed in cloth.

Process.—In preparing this salt, carbonic acid is to be obtained in the same mode as directed for the bicarbonate of potash; but when, instead of forming a bicarbonate, the product contains one-fourth less carbonic acid, it is consequently a sesquicarbonate, consisting of

One and a half equivalent of Carbonic Acid..	33	or	39·76
One equivalent of Soda	32	,,	38·55
Two equivalents of Water	18	,,	21·69
Equivalent....	83.		100·

I am, however, informed by Mr. Everitt that bicarbonate of soda, nearly perfect, may now be obtained from those who manufacture on a large scale.

Properties—This salt is colourless, and in the form of minute indistinct crystals; it is much less soluble in water than the carbonate, and hence it crystallizes as it is formed. The solution acts, though slightly, on turmeric paper. Unlike the carbonate, it does not precipitate a solution of sulphate of magnesia, and its taste is much less alkaline and disagreeable. When strongly heated it loses half an equivalent of carbonic acid and all its water, and is reduced to anhydrous carbonate of soda. This salt occurs native in Africa and also in South America.

Symbol,—Berzelius and Turner .... $NaO, 1\frac{1}{2}\,CO^2, 2HO$.
Brande................. $(S+1\frac{1}{2}C'+2q)$.

Incompatibles.—The same as the carbonate, except that it does not decompose the salts of magnesia until the mixture is heated.

Impurities and Tests.—See Notes: SODÆ SESQUICARBONAS.

Pharmacopœia Preparation.—Liquor Sodæ Effervescens.

Medicinal Uses.—Similar to those of the carbonate. Dose, gr. x. to gr. xxx. This salt is largely employed for the purpose of making what are called *sodaic powders*, by mixture with tartaric acid, and taken during effervescence; these are sometimes intended as a substitute for *soda water*, from which they differ in yielding tartrate of soda, with a portion of carbonic acid diffused through the solution, instead of consisting of bicarbonate of soda with excess of carbonic acid gas.

SODÆ SULPHAS.

Sulphate of Soda.

Sal Catharticus Glauberi, P.L. 1746.
Natron Vitriolatum, P.L. 1788.
Sodæ Sulphas, P.L. 1809, P.L. 1824.

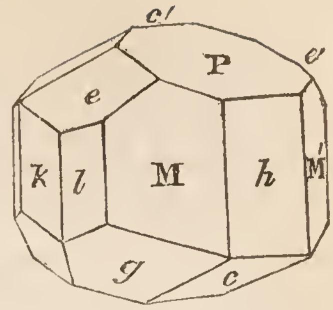
Take of the Salt which remains after the distillation of Hydrochloric Acid two pounds,
Water, boiling, two pints,
Carbonate of Soda as much as is necessary;

Dissolve the Salt in the Water; then gradually add as much Carbonate of Soda as is sufficient to saturate the Acid. Boil down until a pellicle appears, and, the solution being strained, set it aside, that crystals may be formed. The Liquor being poured off, dry them.

Process.—The production of sulphate of soda during the preparation of hydrochloric acid has been explained. The excess of sulphuric acid remaining after the decomposition of the chloride of sodium being comparatively small, the saturation of it by carbonate of soda, instead of expulsion by heat, is of less consequence than in the case of sulphate of potash.

Properties.—Sulphate of soda very readily crystallizes. The primary form of this salt is an *oblique rhombic prism.*

P on M, or M′	101° 20′
P on e, or e'	133 18
P on h	107 44
P on c'	130 45
M on M′	80 24
M on h	130 12
M on l	162 38
M on k	139 48



This salt has a very bitter taste. By exposure to the air it effloresces, and a white powder is left. It is extremely soluble in water, three parts of which, at 60°, dissolve one part of the salt: boiling water dissolves its own weight. It is insoluble in alcohol. When exposed to heat it first undergoes watery fusion by melting in its water of crystallization; when the water has evaporated it becomes opaque white, and at a red heat it melts.

Composition.—Sulphate of Soda is composed of

One equivalent of Sulphuric Acid	40	or 55·55
One equivalent of Soda	32	„ 44·45
Equivalent	72.	100·

In the crystallized state this salt consists of

One equivalent of Sulphuric Acid	40	or 24·69
One equivalent of Soda	32	„ 19·75
Ten equivalents of Water	90	„ 55·56
Equivalent	162.	100·

Symbol,—Berzelius and Turner .... $NaO, SO^3, 10HO$.
Brande................ $(S+S'+10q)$.

Impurities and Tests.—See Notes: SODÆ SULPHAS.

Incompatibles.—Carbonate of potash, chloride of calcium, solution of barytes and barytic salts; acetate and diacetate of lead; and nitrate of silver, if the solution be strong.

Medicinal Uses.—A common and efficient purgative. Its nauseous taste may be in a great degree disguised by the addition of a small quantity of lemon-juice, or of bitartrate of potash Dose, ℥ss. to ℥ij.

SODÆ POTASSIO-TARTRAS.

Potassio-tartrate of Soda.

Natron Tartarizatum, P.L. 1788.
Soda Tartarizata, P.L. 1809, P.L. 1824.

Take of Bitartrate of Potash, powdered, sixteen ounces,
Carbonate of Soda twelve ounces,
Water, boiling, four pints;

Dissolve the Carbonate of Soda in the boiling Water, and add gradually the Bitartrate of Potash. Strain the Liquor; then apply a gentle heat, until a pellicle floats, and set it aside, that crystals may be formed. The Liquor being poured off, dry them. Evaporate the Liquor again that it may yield crystals.

Process.—In this preparation the excess of tartaric acid contained in the bitartrate of potash is saturated with soda, by decomposing the carbonate and expelling its carbonic acid in the gaseous state.

Properties.—This salt forms large and beautiful crystals. The form derived from cleavage is a *right rhombic prism.* This is modified in the crystals measured, as shown in fig. 1.

Fig. 1.

P on M, or M′	90°	0′
P on *c*	138	50
M on M′	100	0
M on *g* } M′ on *g′* }	163	0

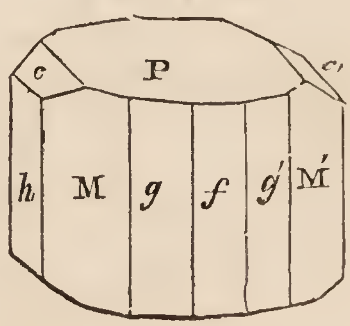
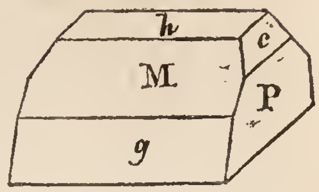


Fig. 2.



There is a peculiarity in the crystals of this substance. They are produced nearly in halves, and appear to have rested or been formed on planes which would have passed through the middle of the entire crystal. One of these natural segments is shown in fig. 2.; but in others of them the front half of fig. 1. is the portion produced, the plane *f* being then uppermost. In some of the segments, however, there is a slight deviation from this exactness of position of the planes *f* or *h*.

This salt, sometimes called *Rochelle Salt* and *Sel de Seignette*, is colourless, inodorous, bitter and saline, very slightly efflorescent when exposed to the air. It is soluble in five parts of water at 60°, and more so in boiling water. It is decomposed by a strong heat; the residuum is a compound of carbonate of potash and carbonate of soda.

Composition.—This is a double salt, consisting of

One equivalent of Tartrate of Potash	114	or 40·
One equivalent of Tartrate of Soda..	98	,, 34·5
Eight equivalents of Water	72	,, 25·5
Equivalent....	284.	100·

Symbol,—

Berzelius and Turner.. $KO, H^2 C^4 O^5$; $NaO, H^2 C^4 O^5$; $8HO$.

Brande.. $(tar' + P + tar' + S + 8q)$, or $(2tar' + P + S + 8q)$.

Impurities and Tests.—See Notes: SODÆ POTASSIO-TARTRAS.

Incompatibles.—Most acids and acidulous salts, except the bitartrate of potash. By the action of the acids the tartrate of potash is converted into bitartrate. The acetate and diacetate of lead and the salts of lime, are decomposed by this compound.

Medicinal Use.—Dose, as a purgative, from ʒij. to ℥j.

LIQUOR SODÆ EFFERVESCENS.

Effervescing Solution of Soda.

Take of Sesquicarbonate of Soda a drachm,
Distilled Water a pint;
Dissolve the Carbonate of Soda in the Water; and

pass into it, compressed by force, more Carbonic Acid than is sufficient for saturation. Keep the solution in a well-stopped vessel.

Remarks.—A solution thus prepared is commonly known by the name of soda water; it is a pleasant mode of exhibiting the alkali, and its powers are supposed not to be diminished by the excess of carbonic acid with which it is combined.

Tests.—See Notes: SODÆ CARBONATIS LIQUOR EFFERVESCENS.

LIQUOR SODÆ CHLORINATÆ.

Solution of Chlorinated Soda.

Take of Carbonate of Soda a pound,
Distilled Water forty-eight fluidounces,
Chloride of Sodium four ounces,
Binoxide of Manganese three ounces,
Sulphuric Acid four ounces;

Dissolve the Carbonate of Soda in two pints of the Water; then put the Chloride of Sodium and Binoxide of Manganese, rubbed to powder, into a retort; and add to them the Sulphuric Acid, previously mixed with three fluidounces of the Water and cooled. Heat [the mixture] and pass the Chlorine first through five fluidounces of the Water, and afterwards into the solution of Carbonate of Soda above directed.

Process.—The extrication of chlorine gas by the mutual action of hydrochloric acid and binoxide of manganese has been already explained. See CALX CHLORINATA. The process here employed being different, it will be proper to describe it also.

One equiv. of chloride of sodium=60, is composed of one equiv. of chlorine=36, and one equiv. of sodium=24. One equiv. of binoxide of manganese=44, consists of 1 equiv. of oxygen=8, and one equiv. of protoxide of manganese=36. When Sulphuric Acid is made to act upon a mixture of this salt

and binoxide, the changes that occur are these: 8=1 equiv. of oxygen is transferred from the binoxide of manganese to the sodium, which, by combining with it, becomes 32=1 equiv. of soda, and the 44 of binoxide of manganese are reduced to 36 of protoxide of manganese; 80=2 equivs of sulphuric acid combine with the soda and protoxide of manganese, forming one equiv. each of sulphate of soda and sulphate of manganese, which remain in the retort, while the 36=1 equiv. of chlorine is evolved in the gaseous state, and passed through water, in order to separate any hydrochloric acid which might accidentally arise, and which would convert a portion of the carbonate of soda into common salt.

60 Chloride of Sodium. { 36 Chlorine *Gas*.
24 Sodium.

8 *Oxygen* ←—— 8 Oxygen. } 44 Binoxide of Manganese.

80 Sulphuric Acid + 32 *Soda* + 36 Protoxide of Manganese.

72 *Sulphate of Soda* + 76 *Sulphate of Manganese.*

The precise nature of this solution, usually called *Labarraque's Soda disinfecting Liquid*, has not been determined. It has been considered as a compound of chloride of sodium, bicarbonate of soda and hypochlorite of soda; but it is questionable whether any sufficient proof has as yet been advanced of the existence of hypochlorous acid. When the quantity of chlorine gas does not exceed that liberated from the ingredients here directed, no carbonic acid is expelled from the carbonate of soda, and the compound formed may be made to crystallize, and consists of chlorine and carbonate or perhaps bicarbonate of soda; these crystals when redissolved reproduce the disinfecting liquid.

Properties.—This solution is of a pale yellow colour; its taste is sharp, saline, and astringent; it first reddens and then bleaches turmeric paper. When exposed to the air it gradually evolves chlorine, and crystals of carbonate of soda are formed; its disinfecting property depends upon this gradual escape of the chlorine.

Incompatibles.—See CALX CHLORINATA.

Tests.—See Notes: SODÆ CHLORINATÆ LIQUOR.

PRÆPARATA E ZINCO.

PREPARATIONS OF ZINC.

ZINCI SULPHAS.

Sulphate of Zinc.

Vitriolum Album Depuratum, P.L. 1721.
Sal Vitrioli, P.L. 1746.
Zincum Vitriolatum, P.L. 1788.
Zinci Sulphas, P.L. 1809, P.L. 1824.

Take of Zinc, in small pieces, five ounces,
Diluted Sulphuric Acid two pints;

Pour gradually the diluted Sulphuric Acid upon the pieces of Zinc, and the effervescence being finished, strain the liquor; then boil it down until a pellicle begins to form. Lastly, set it aside that crystals may be formed.

Remarks.—Zinc is a white metal with a tint of blue; it has considerable lustre, and its specific gravity is about 7. It is crystalline in its structure, and hard, but when rolled at a temperature between 210° and 300°, it becomes malleable and ductile. It melts at 773°, and when slowly cooled crystallizes in prisms. If strongly heated in close vessels it sublimes, but when in the air it combines with oxygen and burns rapidly, yielding a white oxide composed of

One equivalent of Oxygen......	8	or	20
One equivalent of Zinc	32	,,	80
Equivalent..	40.		100.

Symbol,—Berzelius and Turner.. ZnO.
Brande .... (Zn).

Process.—The phenomena and effects which are produced, during the solution of zinc in sulphuric acid, are precisely analogous to those which occur during the solution of iron in the same acid.

Concentrated sulphuric acid does not act upon zinc at common temperatures, but when water is added it is decomposed; the oxygen combines with the zinc to form oxide, similar to that procured by combustion, which is dissolved by the acid, and the hydrogen is evolved in the state of gas.

Hydrogen *Gas.* } Water.

Sulphuric Acid. Zinc. Oxygen.

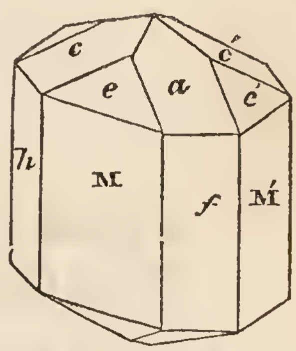
Oxide of Zinc.

Sulphate of Zinc.

Properties.—The solution of sulphate of zinc is colourless, and by evaporation it readily yields crystals, which are also devoid of colour; the primary form of this salt is a *right rhombic prism.*

It may be cleaved parallel to the plane *h* of the annexed figure; no distinct cleavages have been observed in any other direction.

M on M′	91° 7′
M on *f*......................	135 33
M on *h*	134 27
M on *e*......................	128 58
a on *f*......................	120 0
h on *c*	119 23



Properties.—The crystals of this salt are usually very small, and not readily by appearance distinguishable from those of sulphate of magnesia; sulphate of zinc has a disagreeable metallic taste; it is not altered by exposure to the air, but if moderately heated loses its water of crystallization, and when it is subjected to a high temperature is entirely decomposed, the acid being expelled, and the oxide only remaining; it is soluble in two and a half times its weight of water at 60°, and much more so in boiling water. The alkalis ammonia, potash, and soda decompose the solution, and give a white precipitate; but if they are used in excess, then the precipitate is redissolved;

the alkaline carbonates throw down white carbonate of zinc; water impregnated with hydrosulphuric acid decomposes the solution, and forms a white precipitate.

Composition.—Sulphate of Zinc is composed of

One equivalent of Sulphuric Acid	40	or 28
One equivalent of Oxide of Zinc......	40	,, 28
Seven equivalents of Water	63	,, 44
Equivalent....	143.	100·

Symbol,—Berzelius and Turner.... $ZnO, SO^3, 7HO$.
Brande .... $(Zn + S' + 7q)$.

Impurities and Tests.—See Notes: Zinci Sulphas.

Incompatibles.—Alkalis and their carbonates, lime-water, and astringent vegetable infusions.

Pharmacopœia Preparations.—Liquor Aluminis Compositus, Zinci Oxydum.

Medicinal Uses.—Internally as a tonic and astringent. Dose, gr. i. to gr. ij., which may be gradually increased to gr. v. or gr. vi. without exciting nausea. It operates quickly as an emetic, in doses of gr. x. to gr. xxx. Externally it is employed as an astringent, as a substitute for the preparations of lead, in the proportion of gr. x. to eight fluidounces of water.

ZINCI OXYDUM.

Oxide of Zinc.

Zincum Calcinatum, P.L. 1788.
Zinci Oxydum, P.L. 1809, P.L. 1824.

Take of Sulphate of Zinc a pound,
Sesquicarbonate of Ammonia six ounces and a half,
Distilled Water three gallons;

Dissolve the Sulphate of Zinc and Sesquicarbonate of Ammonia, separately, in twelve pints of the distilled Water, and strain; then mix. Wash what is precipitated frequently with water; and lastly, burn it for two hours in a strong fire.

Process.—This is a case of double elective affinity, producing double decomposition; the sulphuric acid of the sulphate of zinc takes the ammonia of the sesquicarbonate, and sulphate of ammonia is formed, which remains in solution; part of the carbonic acid of the sesquicarbonate of ammonia escapes in the gaseous state; but the greater portion of it unites with the oxide of zinc, and the resulting carbonate of zinc is precipitated in the state of a white powder. This, when dried and ignited, loses its carbonic acid, and oxide of zinc remains.

Sulphate of Ammonia.

Sesquicarbonate of Ammonia.	Ammonia.	Sulphuric Acid.	Sulphate of Zinc.
	Carbonic Acid.	Oxide of Zinc.	

Carbonate of Zinc.

Properties.—This oxide is of a yellowish-white colour; it is inodorous, insipid, insoluble in water, but readily taken up by acids in general, and the alkalis ammonia, potash, and soda, but not by their carbonates.

Composition, has been already stated.

Tests and Impurities.—See Notes: ZINCI OXYDUM.

Incompatibles.—This oxide is of course incompatible with the alkalis, acids, and acidulous salts.

Officinal Preparation.—Unguentum Zinci.

Medicinal Use.—Tonic. Dose, gr. j. to gr. vj. twice a day in the form of pill.

CALAMINA PRÆPARATA.

Prepared Calamine.

Lapis Calaminaris Præparatus, P.L. 1721, P.L. 1746.
Calamina Præparata, P.L. 1788, P.L. 1809, P.L. 1824.

Burn the Calamine, then bruise it. Afterwards let it be made into a very fine powder in the same manner as we have directed Chalk to be prepared.

Remarks.—Calamine is a native carbonate of zinc which occurs plentifully in some parts of England; it is usually, however, impure, being mixed with sesquioxide of iron and earthy matter. It is sometimes externally applied in excoriations, and is the basis of the Ceratum Calaminæ.

MISTURÆ.

MIXTURES.

Remarks.—The term *mixture* was originally employed in pharmacy to denote those preparations in which a soluble substance, forming a viscid solution with water, was used to suspend an insoluble one; as when gum arabic is dissolved for the purpose of holding chalk in mechanical mixture: there are a few of the preparations now classed as mixtures which are scarcely included in this definition; and, in prescribing, the word *mixture* is frequently used to signify a compound, all the ingredients of which are in perfect solution.

MISTURA ACACIÆ.

Mixture of Acacia.

Mucilago Arabici Gummi, P.L. 1788.
Mucilago Acaciæ, P.L. 1809, P.L. 1824.

Take of Acacia, powdered, ten ounces,
Water, boiling, a pint;

Rub the Acacia with the Water gradually poured in, and dissolve it.

Medicinal Use.—Demulcent in allaying irritation of the urinary passages, &c.

Pharmacopœia Preparations. — Mistura Cretæ, Mistura Guaiaci, Pilulæ Conii Compositæ, Pilulæ Ipecacuanhæ Compositæ.

MISTURA AMMONIACI.

Mixture of Ammoniacum.

Lac Ammoniaci, P.L. 1746, P.L. 1788.
Mistura Ammoniaci, P.L. 1809, P.L. 1824.

Take of Ammoniacum five drachms,
Water a pint;
Rub the Ammoniacum with the Water, gradually poured in, until they are perfectly mixed.

Medicinal Use.—Expectorant. Dose, f℥ss. to f℥j. It may be advantageously combined with tincture of squill, and more so than with the vinegar of the same medicine, for it is slightly curdled by acids. In this mixture the resinous insoluble matter of the ammoniacum is suspended by the solution of its gummy constituent.

MISTURA AMYGDALÆ.

Mixture of Almond.

Emulsio Communis, P.L. 1746.
Lac Amygdalæ, P.L. 1788.
Mistura Amygdalæ, P.L. 1809.
Mistura Amygdalarum, P.L. 1809, edit. alt., P.L. 1824.

Take of Confection of Almond two ounces and a half,
Distilled Water a pint;
Add the Water to the Confection of Almond gradually while rubbing them, until they are mixed; afterwards strain through linen.

Medicinal Use.—Demulcent and diluent. It is generally employed as a vehicle for more active medicines. Acids, spirit of wine, and of course tinctures, render this preparation turbid, and should not be exhibited with it.

MISTURA ASSAFŒTIDÆ.

Mixture of Assafœtida.

Lac Asæ Fœtidæ, P.L. 1788.
Mistura Assafœtidæ, P.L. 1809, P.L. 1824.

Take of Assafœtida five drachms,
Water a pint;

Rub the Assafœtida with the Water, gradually poured in, until they are perfectly mixed.

Medicinal Use.—Antispasmodic. Dose, from f℥ss. to f℥j. repeated at short intervals in hysteric paroxysms. As it is extremely nauseous, it is rarely used, except as an enema in cases of worms, and the convulsions of infants, arising from irritation of the bowels during dentition.

MISTURA CAMPHORÆ.

Mixture of Camphor.

Julepum e Camphorâ, P.L. 1746.
Mistura Camphorata, P.L. 1788.
Mistura Camphoræ, P.L. 1809, P.L. 1824.

Take of Camphor half a drachm,
Rectified Spirit ten minims,
Water a pint;

First rub the Camphor with the Spirit, then with the Water gradually poured in, and strain through linen.

Medicinal Use.—Stimulant. Dose, f℥j. to f℥ij. every three or four hours. Water dissolves very little camphor; this mixture is therefore generally used only as a vehicle for more important medicines.

MISTURA CASCARILLÆ COMPOSITA.

Compound Mixture of Cascarilla.

Take of Infusion of Cascarilla seventeen fluidounces,
Vinegar of Squill a fluidounce,
Compound Tincture of Camphor two fluidounces;
Mix.

Medicinal Uses.—A combination which is of use in chronic affections of the mucous membrane of the lungs. Dose, from f℥j. to f℥iss. twice or thrice a day.

MISTURA CRETÆ.

Mixture of Chalk.

Julepum e Cretâ, P.L. 1746.
Mistura Cretacea, P.L. 1788.
Mistura Cretæ, P.L. 1809, P.L. 1824.

Take of prepared Chalk half an ounce,
Sugar three drachms,
Mixture of Acacia a fluidounce and a half,
Cinnamon Water eighteen fluidounces;
Mix.

Medicinal Use.—Antacid in diarrhœa. Dose, f℥j. to f℥ij. every three or four hours; its utility is increased when it is combined with opium, catechu, or any other astringent. It is of course incompatible with every acid and acidulous salt.

MISTURA FERRI COMPOSITA.

Compound Mixture of Iron.

Mistura Ferri Composita, P.L. 1809, P.L. 1824.

Take of Myrrh, powdered, two drachms,
Carbonate of Potash a drachm,
Rose Water eighteen fluidounces,
Sulphate of Iron, powdered, two scruples and a half,
Spirit of Nutmeg a fluidounce,
Sugar two drachms;

Rub together the Myrrh with the Spirit of Nutmeg and the Carbonate of Potash, and to these, while rubbing, add first the Rose Water with the Sugar, then the Sulphate of Iron. Put the mixture immediately into a proper glass vessel, and stop it.

Process.—In this preparation double decomposition takes place, precisely as when sulphate of iron is decomposed in preparing the Ferri Sesquioxydum; except that, carbonate of potash being used in this case, sulphate of potash is formed, instead of sulphate of soda, as in that preparation.

Qualities.—This preparation contains protocarbonate of iron in a state of suspension. Iron in this form is probably more active than when it has become sesquioxide, being then difficultly soluble. This mixture has at first a greenish colour, but the protocarbonate of iron, to which that is owing, very readily absorbs oxygen from the air, and becomes reddish yellow sesquioxide.

Mistura Ferri Composita should not be made long before it is wanted for use; for not only is its efficacy diminished by keeping, but, from the different appearances which it presents when re-

cently prepared, to those it exhibits when long kept, the patient would naturally suppose that some mistake had occurred in preparing it.

Medicinal Uses.—Astringent. Tonic. Dose, f℥j. to f℥ij. two or three times a day. It is especially recommended in hysteria and chlorosis, and is unquestionably one of the most efficacious preparations of iron.

Incompatibles.—Acids and acidulous salts, which dissolve the protocarbonate of iron. Vegetable astringents render it black, and are therefore incompatible with it.

MISTURA GENTIANÆ COMPOSITA.

Compound Mixture of Gentian.

Take of Compound Infusion of Gentian twelve fluidounces,
Compound Infusion of Senna six fluidounces,
Compound Tincture of Cardamom two fluidounces;

Mix.

Medicinal Uses.—Usefully employed in dyspeptic affections accompanied with constipation. Dose, f℥j. to f℥ij.

MISTURA GUAIACI.

Mixture of Guaiacum.

Lac Guaiaci, P.L. 1788.
Mistura Guaiaci, P.L. 1809, P.L. 1824.

Take of Guaiacum Resin three drachms,
Sugar half an ounce,
Mixture of Acacia half a fluidounce,
Cinnamon Water nineteen fluidounces;

Rub the Guaiacum with the Sugar, then with the Mixture of Acacia, and to these, while rubbing, add gradually the Cinnamon Water.

Medicinal Uses.—Stimulant. Diaphoretic. Dose, f℥ss. to f℥ij. two or three times a day.

MISTURA MOSCHI.

Mixture of Musk.

Julepum e Moscho, P.L. 1746.
Mistura Moschata, P.L. 1788.
Mistura Moschi, P.L. 1809, P.L. 1824.

Take of Musk,
Acacia, powdered,
Sugar each three drachms,
Rose Water a pint;

Rub the Musk with the Sugar, then with the Acacia, the Rose Water being gradually poured in.

Medicinal Use.—Antispasmodic. Dose, f℥j. to f℥ij.

MISTURA SPIRITÛS VINI GALLICI.

Mixture of Spirit of French Wine.

Take of Spirit of French Wine [Brandy],
Cinnamon Water, each four fluidounces,
The yelks of two Eggs,
Purified Sugar half an ounce,
Oil of Cinnamon two minims;

Mix.

Medicinal Uses.—Stimulant and restorative, and as such employed in the last stage of fever. Dose, f℥ss. to f℥jss.

OLEA DESTILLATA.

DISTILLED OILS.

Remarks.—Distilled Oils are frequently called volatile, essential, or æthereal oils. Their chemical characters are nearly the same from whatever vegetables they are procured; but in their sensible qualities they vary considerably, possessing different colours, consistence, smell, and taste; the two latter properties are, of course, derived from that of the plant from which they are obtained; their colours, like those of the fluid fixed oils, are various shades of yellow, green, and brown: they are generally fluid; but some of them, as especially oil of anise, congeal by a very moderate reduction of temperature. They are very sparingly soluble in water, but sufficiently so to impart their smell and flavour to it. They are very readily dissolved by spirit of wine, and they boil at different temperatures. Their volatility is much increased by the presence of water, with the vapour of which they rise in distillation, at a temperature considerably below their boiling point. They are extremely combustible, and much more so than the expressed oils. Most of them are lighter than water, but some sink in that fluid: among the former are the oils of lavender, rosemary, and mint; and of the latter, the oils of cassia, cinnamon, and cloves are examples. They are easily decomposed by sulphuric and by nitric acid, and when suddenly mixed with the latter, some of them inflame.

Like the expressed oils, they are composed of different proportions of hydrogen, carbon, and oxygen.

The volatile oils are capable of dissolving the fixed oils, and hence the latter are sometimes employed in adulterating them: this fraud may be easily detected by dropping some of the suspected oil on paper: if there be any fixed oil mixed with it, it will remain on the paper after exposure to a moderate heat. Where a cheaper volatile oil has been employed to adulterate a more costly one, the detection can scarcely be made by any other means than by the difference of odour. If spirit of wine be mixed with the oil, then, when it is dropped upon water, a milky fluid is

formed, instead of there remaining a transparent film of oil on the surface of the water.

The Fruit of Anise, Caraway, and Juniper, the Flowers of Chamomile, Lavender, and Elder, the Berries of Pimenta, the tops of Rosemary, and the entire and fresh Herbs of the rest should be employed.

Put any one of these into an alembic, and add as much Water as is sufficient to cover it, then let the Oil distil into a large cold vessel.

OLEUM ANISI.

Oil of Anise.

Oleum ex Seminibus Anisi, P.L. 1721, P.L. 1746.
Oleum Essentiale Anisi, P.L. 1788.
Oleum Anisi, P.L. 1809, P.L. 1824.

OLEUM ANTHEMIDIS.

Oil of Chamomile.

Oleum Florum Chamæmeli, P.L. 1721.
Oleum Essentiale ex Floribus Chamæmeli, P.L. 1746.
Oleum Anthemidis, P.L. 1809, P.L. 1824.

OLEUM CARUI.

Oil of Caraway.

Oleum e Seminibus Carui, P.L. 1721.
Oleum Essentiale ex Seminibus Carui, P.L. 1746.
Oleum Essentiale Carui, P.L. 1788.
Oleum Carui, P.L. 1809, P.L. 1824.

OLEUM JUNIPERI.

Oil of Juniper.

Oleum e Baccis Juniperi, P.L. 1721.
Oleum Essentiale e Baccis Juniperi, P.L. 1746.
Oleum Essentiale Baccæ Juniperi, P.L. 1788.
Oleum Juniperi, P.L. 1809, P.L. 1824.

OLEUM LAVANDULÆ.

Oil of Lavender.

Oleum Florum Lavendulæ, P.L. 1721.
Oleum Essentiale ex Floribus Lavendulæ, P.L. 1746.
Oleum Essentiale Lavendulæ, P.L. 1788.
Oleum Lavandulæ, P.L. 1809, P.L. 1824.

OLEUM MENTHÆ PIPERITÆ.

Oil of Peppermint.

Oleum Essentiale e Foliis Menthæ Piperitidis, P.L. 1746.
Oleum Essentiale Menthæ Piperitidis, P.L. 1788.
Oleum Menthæ Piperitæ, P.L. 1809, P.L. 1824.

OLEUM MENTHÆ PULEGII.

Oil of Pennyroyal.

Oleum Herbæ Pulegii, P.L. 1721.
Oleum Essentiale ex Foliis Pulegii, P.L. 1746.
Oleum Essentiale Pulegii, P.L. 1788.
Oleum Pulegii, P.L. 1809, P.L. 1824.

OLEUM MENTHÆ VIRIDIS.

Oil of Spearmint.

Oleum Herbæ Menthæ, P.L. 1721.
Oleum Essentiale ex Foliis Menthæ Vulgaris, P.L. 1746.
Oleum Essentiale Menthæ Sativæ, P.L. 1788.
Oleum Menthæ Viridis, P.L, 1809, P.L. 1824.

OLEUM ORIGANI.

Oil of Marjoram.

Oleum Herbæ Origani, P.L. 1721.
Oleum Essentiale ex Foliis Origani, P.L. 1746.
Oleum Essentiale Origani, P.L. 1788.
Oleum Origani, P.L. 1809, P.L. 1824.

OLEUM PIMENTÆ.

Oil of Pimenta.

Oleum Pimentæ, P.L. 1809, P.L. 1824.

OLEUM ROSMARINI.

Oil of Rosemary.

Oleum Herbæ Rorismarini, P.L. 1721.
Oleum Essentiale ex Foliis Rorismarini, P.L. 1746.
Oleum Essentiale Rorismarini, P.L. 1788.
Oleum Rosmarini, P.L. 1809, P.L. 1824.

OLEUM SAMBUCI.

Oil of Elder [Flowers].

OLEUM SUCCINI.

Oil of Amber.

Oleum Succini, P.L. 1721, P.L. 1746.
Oleum Succini Rectificatum, P.L. 1788.
Oleum Succini, P.L. 1809, P.L. 1824.

Put Amber into an alembic, so that an Acid Liquor, an Oil, and a Salt, contaminated with the Oil, may distil in a sand-bath, with a heat gradually increased. Afterwards, let the Oil distil again and a third time.

OLEUM TEREBINTHINÆ PURIFICATUM.

Purified Oil of Turpentine.

Oleum sive *Spiritus Terebinthinæ*, P.L. 1721.
Oleum Terebinthinæ Æthereum, P.L. 1746.
Oleum Terebinthinæ Rectificatum, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Oil of Turpentine a pint,
Water four pints;
Let the Oil cautiously distil.

PILULÆ.

PILLS.

PILULÆ ALOËS COMPOSITÆ.

Compound Pills of Aloes.

Pilulæ ex Aloë, P.L. 1788.
Pilulæ Aloës Compositæ, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Aloes, powdered, an ounce,
Extract of Gentian half an ounce,
Oil of Caraway forty minims,
Syrup as much as may be sufficient;
Beat them together until incorporated.

Medicinal Use.—Purgative. Stomachic, in habitual costiveness. Dose, gr. x. to gr. xx.

PILULÆ ALOËS CUM MYRRHÂ.

Pills of Aloes with Myrrh.

Pilulæ Ruffi, P.L. 1721.
Pilulæ Rufi, P.L. 1746.
Pilulæ ex Aloë cum Myrrha, P.L. 1788.
Pilulæ Aloës cum Myrrha, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Aloes two ounces,
Saffron,
Myrrh, each an ounce,
Syrup as much as may be sufficient;
Rub the Aloes and Myrrh separately to powder; then beat the whole together until incorporated.

Medicinal Use.—This preparation is yet commonly called Pilulæ Rufi, and has been very long in use. Dose, gr. x. to gr. xx. as a stimulant and cathartic.

PILULÆ CAMBOGIÆ COMPOSITÆ.

Compound Pills of Camboge.

Pilulæ Cambogiæ Compositæ, P.L. 1809, P.L. 1824.

Take of Camboge, powdered, a drachm,
Aloes, powdered, a drachm and a half,
Ginger, powdered, half a drachm,
Soap two drachms;
Mix the powders together; afterwards, the Soap being added, beat the whole together until incorporated.

Medicinal Use.—Cathartic. Dose, gr. x. to gr. xx.

PILULÆ CONII COMPOSITÆ.

Compound Pills of Hemlock.

Take of Extract of Hemlock five drachms,
Ipecacuanha, powdered, a drachm,
Mixture of Acacia as much as may be sufficient;
Beat them together until incorporated.

Medicinal Use.—Antispasmodic and slightly narcotic. Of use in hooping-cough and incipient stage of phthisis. Dose, gr. v. three times a day.

PILULÆ FERRI COMPOSITÆ.

Compound Pills of Iron.

Pilulæ Ferri cum Myrrhâ, P.L. 1809.
Pilulæ Ferri Compositæ, P.L. 1809, edit. alt., P.L. 1824.

Take of Myrrh, powdered, two drachms,
Carbonate of Soda,
Sulphate of Iron,
Treacle, each a drachm;
Rub the Myrrh with the Carbonate of Soda; then, the Sulphate of Iron being added, rub them again; afterwards beat the whole, in a vessel previously warmed, until incorporated.

Remarks.—In this preparation the sulphate of iron is decomposed by the carbonate of soda, precisely in the same manner,

and in the first instance, with the production of similar compounds, as in preparing the Ferri Sesquioxydum. While, however, the sulphate of soda is washed away from the sesquioxide of iron, it remains with it in preparing the pills, but the quantity is so extremely small as to be quite unimportant. Nearly the same precautions as those which have been given with respect to the Mistura Ferri Composita, will apply to this preparation; viz. that the pills should be prepared only at the moment in which they are wanted, for the protocarbonate of iron at first formed is very readily converted into sesquioxide by absorbing the oxygen of the atmosphere, by which its solubility and power are diminished. The dose is from gr. x. to gr. xx. two or three times a day, in the same cases as the Mistura Ferri Composita.

PILULÆ GALBANI COMPOSITÆ.

Compound Pills of Galbanum.

Pilulæ Gummosæ, P.L. 1721, P.L. 1746.
Pilulæ e Gummi, P.L. 1788.
Pilulæ Galbani Compositæ, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Galbanum an ounce,
Myrrh,
Sagapenum, each an ounce and a half,
Assafœtida half an ounce,
Syrup as much as may be sufficient;
Beat them together until incorporated.

Medicinal Use.—Antispasmodic and emmenagogue. Dose, gr. x. to gr. xx.

PILULÆ HYDRARGYRI.

Pills of Mercury.

Pilulæ Mercuriales, P.L. 1746.
Pilulæ ex Hydrargyro, P.L. 1788.
Pilulæ Hydrargyri, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Mercury two drachms,
Confection of Red Rose three drachms,
Liquorice, powdered, a drachm;

Rub the Mercury with the Confection, until globules can no longer be seen; then, the Liquorice being added, beat the whole together until incorporated.

Remark.—The mercury in this preparation is probably in the state of minute division only.

Medicinal Uses.—It is by far the best form for the internal exhibition of mercury; when it is intended to act upon the system as an alterative, it should be administered in doses of from gr. iv. to gr. vj. Opium may be advantageously given with it, if it should occasion irritation. In doses, from gr. x. to gr. xx. it acts as a mild but efficient purgative.

PILULÆ HYDRARGYRI CHLORIDI COMPOSITÆ.

Compound Pills of Chloride of Mercury.

Pilulæ Hydrargyri Submuriatis, P.L. 1809.
Pilulæ Hydrargyri Submuriatis Compositæ, P.L. 1809, edit. alt., P.L. 1824.

Take of Chloride of Mercury,
Oxysulphuret of Antimony, each two drachms,
Guaiacum Resin, powdered, half an ounce,
Treacle two drachms;

Rub the Chloride of Mercury with the Oxysulphuret

of Antimony, afterwards with the Guaiacum Resin and the Treacle until incorporated.

Medicinal Uses.—Alterative. Dose, gr. v. to gr. x. This pill is much employed in cutaneous eruptions, and in secondary syphilitic symptoms, particularly when affecting the skin. It is commonly known by the name of *Plummer's Pill.*

PILULÆ HYDRARGYRI IODIDI.

Pills of Iodide of Mercury.

Take of Iodide of Mercury a drachm,
Confection of Dog Rose three drachms,
Ginger, powdered, a drachm;
Beat them together until incorporated.

Medicinal Uses.—See HYDRARGYRI IODIDUM.

PILULÆ IPECACUANHÆ COMPOSITÆ.

Compound Pills of Ipecacuanha.

Take of Compound Powder of Ipecacuanha three drachms,
Squill, fresh-dried,
Ammoniacum, each a drachm,
Mixture of Acacia as much as may be sufficient;
Beat them together until incorporated.

Medicinal Uses.—Sudorific and narcotic. Dose, gr. v. three times a day, or gr. x. at night.

PILULÆ RHEI COMPOSITÆ.

Compound Pills of Rhubarb.

Take of Rhubarb, powdered, an ounce,
Aloes, powdered, six drachms,
Myrrh, powdered, half an ounce,
Soap a drachm,
Oil of Caraway half a fluidrachm,
Syrup as much as may be sufficient;
Mix the Powders together, then beat the whole together until incorporated.

Medicinal Use.—Slightly aperient or laxative. Dose, gr. x. to gr. xx.

PILULÆ SAGAPENI COMPOSITÆ.

Compound Pills of Sagapenum.

Take of Sagapenum an ounce,
Aloes half a drachm,
Syrup of Ginger as much as may be sufficient;
Beat them together until incorporated.

Medicinal Uses.—Antibilious and laxative. Successfully employed in colic induced by sedentary occupations. Dose, gr. v. to gr. x.

PILULÆ SAPONIS COMPOSITÆ.

Compound Pills of Soap.

Pilulæ Saponaceæ, P.L. 1746.
Pilulæ ex Opio, P.L. 1788.
Pilulæ Opii, P.L. 1788, edit. alt.
Pilulæ Saponis cum Opio, P.L. 1809, P.L. 1824.

Take of Hard Opium, powdered, half an ounce,
Soap two ounces;
Beat them together until incorporated.

Medicinal Uses.—Anodyne. Narcotic. Dose, gr. iij. to gr. x. Five grains contain one grain of opium.

PILULÆ SCILLÆ COMPOSITÆ.

Compound Pills of Squill.

Pilulæ e Scilla, P.L. 1788.
Pilulæ Scillæ, P.L. 1788, edit. alt.
Pilulæ Scillæ Compositæ, P.L. 1809, P.L. 1824.

Take of Squill, fresh-dried and powdered, a drachm,
Ginger, powdered,
Ammoniacum, powdered, each two drachms,
Soap three drachms,
Syrup as much as may be sufficient;
Mix the Powders together; then beat them with the Soap, and add the Syrup, so as to obtain a proper consistence.

Medicinal Uses.—Expectorant. Diuretic. Dose, gr. x. to gr. xx.

PILULÆ STYRACIS COMPOSITÆ.

Compound Pills of Storax.

Pilulæ e Styrace, P.L. 1721, P.L. 1746.

Take of Storax, strained, three drachms,
Hard Opium, powdered,
Saffron, each a drachm;
Beat them together until incorporated.

Medicinal Uses.—Balsamic and slightly expectorant in chronic affections of the lungs. Dose, gr. iij. to gr. x. Five grains contain one grain of opium.

PULVERES.

POWDERS.

PULVIS ALOËS COMPOSITUS.

Compound Powder of Aloes.

Pulvis Aloëticus cum Guaiaco, P.L. 1788.
Pulvis Aloës cum Guaiaco, P.L. 1788, edit. alt.
Pulvis Aloës Compositus, P.L. 1809, P.L. 1824.

Take of Aloes an ounce and a half,
Guaiacum Resin an ounce,
Compound Powder of Cinnamon half an ounce;
Rub the Aloes and the Guaiacum Resin separately to powder; then mix them with the Compound Powder of Cinnamon.

Medicinal Uses.—This powder is cathartic and sudorific. Dose, gr. x. to gr. xx.

PULVIS CINNAMOMI COMPOSITUS.

Compound Powder of Cinnamon.

Species Diambræ sine Odoratis, P.L. 1721.
Species Aromaticæ, P.L. 1746.
Pulvis Aromaticus, P.L. 1788.
Pulvis Cinnamomi Compositus, P.L. 1809, P.L. 1824.

Take of Cinnamon two ounces,
Cardamom an ounce and a half,
Ginger an ounce,
Long Pepper half an ounce ;

Rub them together, so that a very fine powder may be made.

Medicinal Uses.—This preparation is stimulant and carminative. Dose, gr. v. to gr. x. in the form of bolus, or mixed with water. It is generally employed to give warmth to more active remedies.

PULVIS CRETÆ COMPOSITUS.

Compound Powder of Chalk.

Pulvis e Bolo Compositus sine Opio. Species e Scordio sine Opio, P.L. 1746.
Pulvis e Creta Compositus, P.L. 1788.
Pulvis Cretæ Compositus, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Prepared Chalk half a pound,
Cinnamon four ounces,
Tormentil,
Acacia, each three ounces,
Long Pepper half an ounce ;

Rub them separately to very fine powder; then mix them.

Medicinal Uses.—Astringent and antacid. Dose, gr. v. to gr. xxx.

PULVIS CRETÆ COMPOSITUS CUM OPIO.

Compound Powder of Chalk with Opium.

Pulvis e Bolo Compositus cum Opio. Species e Scordio cum Opio, P.L. 1746.
Pulvis e Creta Compositus cum Opio, P.L. 1788.
Pulvis Cretæ Compositus cum Opio, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Compound Powder of Chalk six ounces and a half,
Hard Opium, powdered, four scruples;
Mix them.

Medicinal Uses.—Astringent. Anodyne. Dose, gr. v. to gr. xxx. Forty grains contain one grain of opium. This and the former preparation, on account of the carbonate of lime which they contain, are incompatible with acids and acidulous salts.

PULVIS JALAPÆ COMPOSITUS.

Compound Powder of Jalap.

Take of Jalap three ounces,
Bitartrate of Potash six ounces,
Ginger two drachms;
Rub them separately to powder; then mix them.

Medicinal Use.—Purgative. Dose, gr. xx. to gr. xl.

PULVIS IPECACUANHÆ COMPOSITUS.

Compound Powder of Ipecacuanha.

Pulvis Ipecacuanhæ Compositus, P.L. 1788,
P.L. 1809, P.L. 1824.

Take of Ipecacuanha, powdered,
Hard Opium, powdered, each a drachm,
Sulphate of Potash, powdered, an ounce;
Mix them.

Remarks.—This powder has been long employed as a sudorific, under the name of Dover's Powder. The sulphate of potash is used merely to divide the more active ingredients. In doses of gr. v. to gr. xx. it acts as a powerful sudorific; it may be given diffused in a mucilaginous fluid, or in the form of bolus. Ten grains contain one grain of opium.

PULVIS KINO COMPOSITUS.

Compound Powder of Kino.

Pulvis Kino Compositus, P.L. 1809, P.L. 1824.

Take of Kino fifteen drachms,
Cinnamon half an ounce,
Hard Opium a drachm;
Rub them separately to very fine powder; then mix them.

Medicinal Use.—Astringent. Dose, gr. v. to gr. xx. Twenty grains contain one grain of opium.

PULVIS SCAMMONII COMPOSITUS.

Compound Powder of Scammony.

Pulvis Comitis Warwicensis, P.L. 1721.
Pulvis e Scammonio Compositus, P.L. 1746, P.L. 1788.
Pulvis Scammonii Compositus, P.L. 1788, edit. alt.
Pulvis Scammoneæ Compositus, P.L. 1809, P.L. 1824.

Take of Scammony,
Hard Extract of Jalap, each two ounces,
Ginger half an ounce;

Rub them separately to very fine powder; then mix them.

Medicinal Use.—Cathartic. Dose, gr. v. to gr. xx.

PULVIS TRAGACANTHÆ COMPOSITUS.

Compound Powder of Tragacanth.

Species Diatragacanthæ Frigidæ, P.L. 1721.
Pulvis e Tragacanthâ Compositus, P.L. 1746, P.L. 1788.
Pulvis Tragacanthæ Compositus, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Tragacanth, powdered,
Acacia, powdered,
Starch, each an ounce and a half,
Sugar three ounces;

Rub the Starch and Sugar together to powder; then the Tragacanth and Acacia being added, mix them all.

Medicinal Use.—Demulcent. Dose, gr. x. to ʒj.

SPIRITUS.

SPIRITS.

Spirit of wine, which is alcohol diluted with water, is employed in pharmacy for various important purposes, and of different degrees of strength, according to circumstances. In its concentrated state it is termed *alcohol*, and is prepared by the process stated below; when diluted with a small proportion of water, it is called *rectified spirit*; and when more largely diluted, *proof spirit*: these are articles of the Materia Medica.

Some of the preparations in which Spirit is used in the Pharmacopœia, are classed together under the title of *Spiritus*; it includes spirit of ammonia, and several aromatic distilled spirits; *Tincturæ* and *Ætherea* are the two other classes.

ALCOHOL.

Alcohol.

Alkohol, P.L. 1788.
Alcohol, P.L. 1809, P.L. 1824.

Take of Rectified Spirit a gallon,
Chloride of Calcium a pound;

Put the Chloride of Calcium into the Spirit, and when it is dissolved, let seven pints and five fluidounces distil.

Process.—Chloride of Calcium is a salt which, as already noticed, has a great affinity for water, and is soluble in spirit; when the solution is subjected to distillation, the chloride remains in the retort with nearly the whole of the water.

The strongest spirit which has hitherto been produced is of

sp. gr. 0·796, at the temperature of 60°: and it is, probably, alcohol free from water; according to Saussure, it consists of

Three equivalents of Hydrogen..	1 × 3 = 3	or	13·04
Two equivalents of Carbon	6 × 2 = 12	,,	52·17
One equivalent of Oxygen......	8	,,	34·79
Equivalent....	23.		100·

Properties.—Alcohol, when pure, is colourless and transparent; its odour is rather pleasant, and its taste is penetrating. It has never been rendered solid by exposure to any degree of cold, either natural or artificial. Alcohol is that part of fermented liquors from which their intoxicating power is derived. It is extremely volatile, producing great cold during its evaporation; and the stronger the alcohol the greater is the cold produced. It is highly inflammable, and during combustion, water and carbonic acid are generated, the quantity of the former exceeding that of the weight of alcohol burned.

Alcohol of sp. gr. 0·800 boils at 174°, or 38° below the boiling point of water, and it is very expansible by heat. When it is mixed with water, heat is evolved, the capacity of the compound being less than that of its ingredients; and the mixture occupies considerably less space than the water and alcohol do when separate.

Alcohol prevents animal substances which are immersed in it from decay; and hence its use in the preservation of anatomical preparations. Its solvent power is very great, and it is on this account that it is in many cases employed in pharmacy, especially in the preparation of the tinctures of those substances which are resinous, and consequently insoluble in water. It is also largely employed in the preparation of æther.

SPIRITUS AMMONIÆ.

Spirit of Ammonia.

Spiritus Salis Ammoniaci Dulcis, P.L. 1746.
Spiritus Ammoniæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Hydrochlorate of Ammonia ten ounces,
Carbonate of Potash sixteen ounces,
Rectified Spirit,
Water, each, three pints;
Mix them, and let three pints distil.

Process.—In this operation the hydrochlorate of ammonia is decomposed, as already described when treating of the Ammoniæ Sesquicarbonas; in the present case, however, chloride of potassium remains instead of chloride of calcium, because carbonate of potash is substituted for carbonate of lime, and the carbonate of ammonia is a neutral, instead of a sesquicarbonate. This is also the case with the Spiritus Ammoniæ Aromaticus and Spiritus Ammoniæ Fœtidus. It is composed of

One equivalent of Carbonic Acid ..	22	or	56·5
One equivalent of Ammonia	17	„	43·5
Equivalent....	39.		100·

As this carbonate contains only two-thirds as much carbonic acid as that procured by the use of carbonate of lime, the greater pungency of Spiritus Ammoniæ and Spiritus Ammoniæ Aromaticus, than of Liquor Ammoniæ Sesquicarbonatis, is readily accounted for.

Properties.—Spiritus Ammoniæ is a transparent, colourless fluid; its smell is pungent and its taste acrid; it turns turmeric brown, indicating its alkaline properties. There is usually more carbonate of ammonia formed than the spirit is capable of dissolving, and this remains in the receiver in an imperfectly crystalline state.

SPIRITUS AMMONIÆ AROMATICUS.

Aromatic Spirit of Ammonia.

Spiritus Salis Volatilis Oleosus, P.L. 1721.
Spiritus Volatilis Aromaticus, P.L. 1746.
Spiritus Ammoniæ Compositus, P.L. 1788.
Spiritus Ammoniæ Aromaticus, P.L. 1809, P.L. 1824.

Take of Hydrochlorate of Ammonia five ounces,
Carbonate of Potash eight ounces,
Cinnamon, bruised,
Cloves, bruised, each two drachms,
Lemon Peel four ounces,
Rectified Spirit,
Water, each four pints;
Mix them, and let six pints distil.

Properties.—This preparation resembles the last, but is rendered more agreeable by the aromatics, whether applied to the nostrils or internally exhibited.

Incompatibles.—Acids, acidulous salts, earthy and metallic salts, and lime-water.

Officinal Preparations.—Tinctura Guaiaci Composita, Tinctura Valerianæ Composita.

Medicinal Use.—Stimulant in languors and flatulent colic. Dose, f℥ss. to f℥j. in water.

SPIRITUS AMMONIÆ FŒTIDUS.

Fetid Spirit of Ammonia.

Spiritus Volatilis Fœtidus, P.L. 1746.
Spiritus Ammoniæ Fœtidus, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Hydrochlorate of Ammonia ten ounces,
Carbonate of Potash sixteen ounces,
Rectified Spirit,
Water, each three pints,
Assafœtida five ounces ;
Mix them ; then with a slow fire let three pints distil.

Properties.—Colourless, pungent, and, as its name expresses, fetid. By long keeping it acquires a brownish colour.

Incompatibles.—The same as with the last preparations.

Medicinal Uses.—Stimulant. Antispasmodic. Dose, f℥ss. to f℥j. in water.

SPIRITUS ANISI.

Spirit of Anise.

Spiritus Anisi, P.L. 1809, P.L. 1824.

Take of Anise, bruised, ten ounces,
Proof Spirit a gallon,
Water two pints;
Mix them; then with a slow fire let a gallon distil.

Medicinal Uses.—Stimulant and carminative in flatulent colic, &c. Dose, f℥ij. to f℥iv. in water.

SPIRITUS ARMORACIÆ COMPOSITUS.

Compound Spirit of Horseradish.

Aqua Raphani Composita, P.L. 1721, P.L. 1746.
Spiritus Raphani Compositus, P.L. 1788.
Spiritus Armoraciæ Compositus, P.L. 1809, P.L. 1824.

Take of Horseradish, sliced,
Orange Peel, dried, each twenty ounces,
Nutmegs, bruised, five drachms,
Proof Spirit a gallon,
Water two pints;
Mix them; then with a slow fire let a gallon distil.

Pharmacopœia Preparation.—Infusum Armoraciæ Compositum.
Medicinal Uses.—Stimulant, Dose, f℥ij. to f℥iv.

SPIRITUS CARUI.

Spirit of Caraway.

Aqua Seminum Carui, P.L. 1746.
Spiritus Carui, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Caraway, bruised, twenty-two ounces,
Proof Spirit a gallon,
Water two pints;
Mix them; then with a slow fire let a gallon distil.

Medicinal Uses.—Carminative. Stimulant. Dose, fʒij. to fʒiv.

SPIRITUS CINNAMOMI.

Spirit of Cinnamon.

Aqua Cinnamomi Fortis, P.L. 1721.
Aqua Cinnamomi Spirituosa, P.L. 1746.
Spiritus Cinnamomi, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Oil of Cinnamon two drachms,
Proof Spirit a gallon,
Water a pint;
Mix them; then with a slow fire let a gallon distil.

Medicinal Uses.—Stomachic. Stimulant. Dose, fʒij. to fʒiv.

SPIRITUS JUNIPERI COMPOSITUS.

Compound Spirit of Juniper.

Aqua Juniperi Composita, P.L. 1746.
Spiritus Juniperi Compositus, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Juniper Fruit, bruised, fifteen ounces,
Caraway, bruised,
Fennel, bruised, each two ounces,
Proof Spirit a gallon,
Water two pints;
Mix them; then with a slow fire let a gallon distil.

Medicinal Uses.—Stimulant. Diuretic. Dose, fʒij. to fʒiv. It is principally exhibited with other diuretics, as foxglove, &c.

SPIRITUS LAVANDULÆ.

Spirit of Lavender.

Spiritus Lavendulæ Simplex, P.L. 1746.
Spiritus Lavendulæ, P.L. 1788.
Spiritus Lavandulæ, P.L. 1809, P.L. 1824.

Take of Lavender, fresh, two pounds and a half,
Rectified Spirit a gallon,
Water two pints;
Mix them; then with a slow fire let a gallon distil.

Pharmacopœia Preparations.—Linimentum Camphoræ Compositum and Tinctura Lavandulæ Composita.

SPIRITUS MENTHÆ PIPERITÆ.

Spirit of Peppermint.

Aqua Menthæ Piperitidis Spirituosa, P.L. 1746.
Spiritus Menthæ Piperitidis, P.L. 1788.
Spiritus Menthæ Piperitæ, P.L. 1809, P.L. 1824.

Take of Oil of Peppermint three drachms,
Proof Spirit a gallon,
Water a pint;
Mix them; then with a slow fire let a gallon distil.

Medicinal Uses.—Stimulant. Carminative. Dose, f℥ij. to f℥iv.

SPIRITUS MENTHÆ VIRIDIS.

Spirit of Spearmint.

Aqua Menthæ Vulgaris Spirituosa, P.L. 1746.
Spiritus Menthæ Sativæ, P.L. 1788.
Spiritus Menthæ Viridis, P.L. 1809, P.L. 1824.

Take of Oil of Spearmint three drachms,
Proof Spirit a gallon,
Water a pint;
Mix them; then with a slow fire let a gallon distil.

Medicinal Uses and dose same as the Spirit of Peppermint.

SPIRITUS MENTHÆ PULEGII.

Spirit of Pennyroyal.

Aqua Pulegii Spirituosa, P.L. 1746.
Spiritus Pulegii, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Oil of Pennyroyal three drachms,
Proof Spirit a gallon,
Water a pint;
Mix them; then with a slow fire let a gallon distil.

Medicinal Uses and dose same as the Spirit of Peppermint.

SPIRITUS MYRISTICÆ.

Spirit of Nutmeg.

Aqua Nucis Moschatæ, P.L. 1746.
Spiritus Nucis Moschatæ, P.L. 1788.
Spiritus Myristicæ, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Nutmegs, bruised, two ounces and a half,
Proof Spirit a gallon,
Water a pint;
Mix them; then with a slow fire let a gallon distil.

Medicinal Uses and dose same as the Spirit of Peppermint.

SPIRITUS PIMENTÆ.

Spirit of Pimenta.

Spiritus Pimento, P.L. 1788.
Spiritus Pimentæ, P.L. 1809, P.L. 1824.

Take of Pimenta, bruised, two ounces and a half,
Proof Spirit a gallon,
Water a pint;
Mix them; then with a slow fire let a gallon distil.

Medicinal Uses and dose same as the Spirit of Peppermint.

SPIRITUS ROSMARINI.

Spirit of Rosemary.

Spiritus Rorismarini, P.L. 1746, P.L. 1788.
Spiritus Rosmarini, P.L. 1809, P.L. 1824.

Take of Oil of Rosemary two drachms,
Rectified Spirit a gallon,
Water a pint;
Mix them; then with a slow fire let a gallon distil.

Pharmacopœia Preparations.—Linimentum Saponis, Tinctura Lavandulæ Composita.

SYRUPI.

SYRUPS.

Syrups are to be kept in a place where the heat never exceeds 55°.

Remarks.—Syrups are strong solutions of sugar in water, generally coloured or flavoured with vegetable matter; and sometimes, but more rarely, they are active medicines; it is particularly requisite that they should be kept in a cool place, or otherwise acetic acid will be generated by fermentation, and this may interfere with medicines, the virtues of which it is employed to increase, or whose disagreeable flavour it is intended to disguise.

SYRUPUS.

Syrup.

Syrupus Simplex, P.L. 1746.
Syrupus, P.L. 1809.
Syrupus Simplex, P.L. 1809, edit. alt., P.L. 1824.

Take of Sugar ten pounds,
Water three pints;
Dissolve the Sugar in the Water with a gentle heat.

SYRUPUS ALTHÆÆ.

Syrup of Marshmallow.

Syrupus de Althæâ, P.L. 1721.
Syrupus ex Althæâ, P.L. 1746.
Syrupus Althææ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Marshmallow Root, bruised, eight ounces,
Sugar two pounds and a half,
Water four pints;

Boil down the Water with the Root to half, and press out the cooled liquor. Set it by for twenty-four hours, that the dregs may subside; then pour off the liquor, and, the Sugar being added, boil down to a proper consistence.

This syrup contains the mucilaginous matter of the marshmallow, and is used as a demulcent. It is apt to spoil by fermentation, and does not possess any active property.

SYRUPUS AURANTII.

Syrup of Orange [Peel].

Syrupus de Cortice Aurantiorum, P.L. 1721.
Syrupus e Corticibus Aurantiorum, P.L. 1746.
Syrupus Corticis Aurantii, P.L. 1788.
Syrupus Aurantii, P.L. 1809.
Syrupus Aurantiorum, P.L. 1809, edit. alt., P.L. 1824.

Take of Orange Peel, fresh, two ounces and a half,
Water, boiling, a pint,
Sugar three pounds;

Macerate the Peel in the Water for twelve hours, in a vessel lightly covered, then pour off the liquor, and add the Sugar to it.

This syrup is employed merely on account of its grateful aromatic flavour.

SYRUPUS CROCI.

Syrup of Saffron.

Syrupus Croci, P.L. 1721, P.L. 1746, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Saffron ten drachms,
Water, boiling, a pint,
Sugar three pounds;
Macerate the Saffron in the Water for twelve hours, in a vessel lightly covered, then strain the liquor, and add the Sugar to it.

It is used merely on account of its fine colour.

SYRUPUS LIMONUM.

Syrup of Lemons.

Syrupus e Succo Citriorum, P.L. 1721.
Syrupus e Succo Limonum, P.L. 1746.
Syrupus Succi Limonis, P.L. 1788.
Syrupus Limonis Succi, P.L. 1788, edit. alt.
Syrupus Limonis, P.L. 1809.
Syrupus Limonum, P.L. 1809, edit. alt., P.L. 1824.

Take of the Juice of Lemons, strained, a pint,
Sugar two pounds and a half;
Dissolve the Sugar in the Juice of Lemons with a gentle heat, then set it aside for twenty-four hours; afterwards remove the scum, and if there be any dregs, pour the clear liquor from them.

This is a pleasant syrup; but it must be remembered that its acidity prevents its being employed in any composition that contains alkalis, alkaline earths, or their carbonates.

SYRUPUS MORI.

Syrup of Mulberry.

Syrupus Mororum, P.L. 1746.
Syrupus Mori, P.L. 1788, P.L. 1809, P.L. 1824.

Take of the Juice of Mulberries, strained, a pint,
Sugar two pounds and a half;
Dissolve the Sugar in the Juice of Mulberries with a gentle heat, and proceed in the same manner as directed for Syrup of Lemons.

This is used for the same purposes as the former, and it has the advantage of a fine colour.

SYRUPUS PAPAVERIS.

Syrup of Poppy.

Syrupus de Meconio sive Diacodium, P.L. 1721.
Syrupus e Meconio sive Diacodion, P.L. 1746.
Syrupus Papaveris Albi, P.L. 1788.
Syrupus Papaveris, P.L. 1809, P.L. 1824.

Take of Poppy [Capsules] three pounds,
Sugar five pounds,
Water, boiling, five gallons:
Boil down the Capsules in the Water to two gallons, and press strongly. Again boil down the strained liquor to four pints, and strain while hot. Set it by for twelve

hours, that the dregs may subside; then boil down the clear liquor to two pints; add the Sugar and dissolve it.

Medicinal Use.—Anodyne. Narcotic. Dose, f℥j. to f℥j. This syrup is very apt to ferment, and hence the necessity of keeping it cool. It is principally used for children.

SYRUPUS RHAMNI.

Syrup of Buckthorn.

Syrupus de Spinâ Cervinâ, P.L. 1721.
Syrupus e Spinâ Cervinâ, P.L. 1746.
Syrupus Spinæ Cervinæ, P.L. 1788.
Syrupus Rhamni, P.L. 1809, P.L. 1824.

Take of the Juice of Buckthorn, fresh, four pints,
Ginger, sliced,
Pimenta, powdered, each six drachms,
Sugar four pounds;

Set by the Juice for three days, that the dregs may subside, and strain. To a pint of the clear Juice add the Ginger and Pimenta; then macerate with a gentle heat for four hours, and strain; boil down that which is left to the measure of a pint and a half; mix the liquors; add the Sugar, and dissolve it.

Medicinal Use.—Cathartic. Dose, f℥ss. to f℥j. It is an unpleasant remedy both to the taste and in its operation, and is but little used.

SYRUPUS RHŒADOS.

Syrup of Red Poppy.

Syrupus de Papavere Erratico, P.L. 1721.
Syrupus Papaveris Erratici, P.L. 1746, P.L. 1788.
Syrupus Rhœados, P.L. 1809, P.L. 1824.

Take of Red Poppy [Petals] a pound,
Water, boiling, a pint,
Sugar two pounds and a half;

Add the [Petals of the] Red Poppy gradually to the Water, heated in a water-bath, frequently stirring them; then, the vessel being removed, macerate for twelve hours; afterwards press out the liquor, and when the dregs have subsided, add the Sugar, and dissolve it.

This syrup is of a fine red colour, and is used only on that account.

SYRUPUS ROSÆ.

Syrup of Rose.

Syrupus e Rosis Siccis, P.L. 1721.
Syrupus Rosarum Solutivus, P.L. 1746.
Syrupus Rosæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Damask Rose [Petals], dried, seven ounces,
Sugar six pounds,
Water, boiling, three pints;

Macerate the Rose Petals in the Water for twelve hours, and strain. Evaporate the strained liquor in a water-bath to two pints; then add the Sugar, and dissolve it.

Medicinal Use.—Purgative, but weakly so; it is sometimes given to infants. Dose, f℥ij. to f℥j.

SYRUPUS SARZÆ.

Syrup of Sarsaparilla.

Syrupus Sarsaparillæ, P.L. 1824.

Take of Sarsaparilla, sliced, fifteen ounces,
Water, boiling, a gallon,
Sugar fifteen ounces;
Macerate the Sarsaparilla in the Water for twenty-four hours; then boil down to four pints, and strain the liquor while hot; afterwards add the Sugar, and evaporate to a proper consistence.

Medicinal Use.—This is employed as an adjunct to the decoction of Sarsaparilla.

SYRUPUS SENNÆ.

Syrup of Senna.

Syrupus Sennæ, P.L. 1809, P.L. 1824.

Take of Senna two ounces and a half,
Fennel, bruised, ten drachms,
Manna three ounces,
Sugar fifteen ounces,
Water, boiling, a pint;
Macerate the Senna and Fennel in the Water with a gentle heat for an hour. Mix the Manna and Sugar with the strained liquor; then boil down to a proper consistence.

Medicinal Use.—This is a purgative syrup intended for children. Dose, f℥ij. to f℥iv.

SYRUPUS TOLUTANUS.

Syrup of Tolu.

Syrupus Balsamicus, P.L. 1721, P.L. 1746.
Syrupus Tolutanus, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Balsam of Tolu ten drachms,
Water, boiling, a pint,
Sugar two pounds and a half;

Boil the Balsam in the Water for half an hour in a vessel lightly covered, frequently stirring, and strain the cooled liquor; then add the Sugar, and dissolve it.

It is employed merely to give a pleasant flavour to draughts and mixtures.

SYRUPUS ZINGIBERIS.

Syrup of Ginger.

Syrupus Zingiberis, P.L. 1746, P.L. 1788,
P.L. 1809, P.L. 1824.

Take of Ginger, sliced, two ounces and a half,
Water, boiling, a pint,
Sugar two pounds and a half;

Macerate the Ginger in the Water for four hours, and strain; then add the Sugar, and dissolve it.

Medicinal Uses.—This syrup is impregnated with the flavour and warmth of the ginger, and is a useful adjunct to bitter infusions and griping purgatives.

TINCTURÆ.

TINCTURES.

All Tinctures should be prepared in stopped glass vessels, and frequently shaken during maceration.

Remarks.—Tinctures are solutions of various substances in spirit of wine, of different degrees of strength; they are principally prepared from vegetable matters, but in some cases metallic salts are dissolved in it; in other instances tinctures contain ammonia, and in one case animal matter is dissolved by spirit.

The substances which are best adapted for tinctures are those which are active in small doses; for if large ones should be required, they might be in many cases objectionable on account of the quantity of spirit necessarily exhibited with them.

Those substances which are imperfectly soluble in water, or totally insoluble in it, or which spoil unless they are preserved by spirit, are proper for tinctures, provided the quantity of spirit admits of their being given in sufficiently large doses; opium, digitalis, &c. are medicines of this class.

Tinctures are frequently useful additions to infusions and decoctions, the spirit preventing the decomposition, which otherwise occurs rapidly. Tinctures which hold resinous matter in solution, such as that of guaiacum, suffer decomposition on the addition of water.

TINCTURA ALOËS.

Tincture of Aloes.

Tinctura Aloës, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Aloes, powdered, an ounce,
Extract of Liquorice three ounces,
Water a pint and a half;
Rectified Spirit half a pint;
Macerate for fourteen days, and strain.

Medicinal Uses.—Purgative. Stomachic. Dose, f℥ss. to f℥iss.

TINCTURA ALOËS COMPOSITA.

Compound Tincture of Aloes.

Elixir Proprietatis, P.L. 1721.
Elixir Aloës, P.L. 1746.
Tinctura Aloës Composita, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Aloes, powdered, four ounces,
Saffron two ounces,
Tincture of Myrrh two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Purgative. Stomachic. Dose, f℥j. to f℥ij.

TINCTURA AMMONIÆ COMPOSITA.

Compound Tincture of Ammonia.

Spiritus Ammoniæ Succinatus, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Mastich two drachms,
Rectified Spirit nine fluidrachms,
Oil of Lavender fourteen minims,
Oil of Amber four minims,
Stronger Solution of Ammonia a pint;
Macerate the Mastich in the Spirit, that it may be dissolved, and pour off the clear tincture; then add the other ingredients, and shake them all together.

Qualities.—This preparation has a milky appearance, owing to the separation of the mastich from its solution in spirit by the Liquor Ammoniæ. It is commonly called *Eau de Luce,* but no oil of amber is contained in the preparation originally so denominated.

Incompatibles.—Acids; acidulous, metallic, and earthy salts.

Medicinal Uses.—Stimulant and antispasmodic. Dose, ♏v. to ♏x. in water.

TINCTURA ASSAFŒTIDÆ.

Tincture of Assafœtida.

Tinctura Fœtida, P.L. 1746.
Tinctura Asæ Fœtidæ, P.L. 1788.
Tinctura Assafœtidæ, P.L. 1809, P.L. 1824.

Take of Assafœtida five ounces,
Rectified Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Antispasmodic. Dose, f℥ss. to f℥iss. This tincture is rendered turbid when mixed with water, owing to the precipitation of the resinous matter of the assafœtida.

TINCTURA AURANTII.

Tincture of Orange [Peel].

Tinctura Corticis Aurantii, P.L. 1788.
Tinctura Aurantii Corticis, P.L. 1788, edit. alt.
Tinctura Aurantii, P.L. 1809, P.L. 1824.

Take of Orange Peel, dried, three ounces and a half,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, f℥ij. to f℥iij. It is a useful adjunct to bitter infusions and decoctions.

TINCTURA BALSAMI TOLUTANI.

Tincture of Balsam of Tolu.

Tinctura Balsami Tolutani, P.L. 1788.

Take of Balsam of Tolu two ounces,
Rectified Spirit two pints;
Macerate until the Balsam is dissolved, and strain.

Medicinal Use.—Employed in old coughs and catarrhal affections.

TINCTURA BENZÖINI COMPOSITA.

Compound Tincture of Benzoin.

Balsamum Traumaticum, P.L. 1746.
Tinctura Benzoës Composita, P.L. 1788.
Tinctura Benzöini Composita, P.L. 1809, P.L. 1824.

Take of Benzoin three ounces and a half,
Storax, strained, two ounces and a half,
Balsam of Tolu ten drachms,
Aloes five drachms,
Rectified Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Expectorant. Dose, f℥ss. to f℥ij. In chronic catarrh and confirmed asthma. It is decomposed by water, resinous matter being precipitated, and must therefore be triturated with yelk of egg, or with mucilage. It is more employed externally than internally, as a stimulant to languid ulcers; but its application to fresh wounds, for which it is mostly employed under the name of *Friar's Balsam,* appears to be injurious, by preventing the wound from healing by the first intention.

TINCTURA CALUMBÆ.

Tincture of Calumba.

Tinctura Colombæ, P.L. 1788.
Tinctura Calumbæ, P.L. 1809, P.L. 1824.

Take of Calumba, sliced, three ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, f℥j. to f℥iij.

TINCTURA CAMPHORÆ.

Tincture of Camphor.

Spiritus Vini Camphoratus, P.L. 1721.
Spiritus Vinosus Camphoratus, P.L. 1746.
Spiritus Camphoratus, P.L. 1788.
Spiritus Camphoræ, P.L. 1809, P.L. 1824.

Take of Camphor five ounces,
Rectified Spirit two pints;
Mix, that the Camphor may be dissolved.

Medicinal Uses.—Stimulant. It is used only externally. It is frequently applied to chilblains, and in cases of chronic rheumatism and numbness.

It is decomposed by water, which, combining with the spirit, precipitates the camphor.

TINCTURA CAMPHORÆ COMPOSITA.

Compound Tincture of Camphor.

Elixir Paregoricum, P.L. 1746.
Tinctura Opii Camphorata, P.L. 1788.
Tinctura Camphoræ Composita, P.L. 1809, P.L. 1824.

Take of Camphor two scruples and a half,
Hard Opium, powdered,
Benzoic Acid, each seventy-two grains,
Oil of Anise a fluidrachm,
Proof Spirit two pints ;
Macerate for fourteen days, and strain.

Medicinal Use.—Anodyne. Dose, f℥j. to f℥iij. A fluidounce contains nearly two grains of opium.

TINCTURA CANTHARIDIS.

Tincture of Cantharides.

Tinctura Cantharidum, P.L. 1721, P.L. 1746.
Tinctura Cantharidis, P.L. 1788.
Tinctura Lyttæ, P.L. 1809.
Tinctura Cantharidis, P.L. 1824.

Take of Cantharides, bruised, four drachms,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Diuretic. Stimulant. Dose, ♏x. to f℥j. given in some demulcent infusion. It is useful in gleets, fluor albus, and incontinence of urine. It is likewise employed externally as a stimulating embrocation or rubefacient, in conjunction with Camphor Liniment, &c.

TINCTURA CAPSICI.

Tincture of Capsicum.

Tinctura Capsici, P.L. 1809, P.L. 1824.

Take of Capsicum, bruised, ten drachms,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Stimulant. Dose, ♏x. to f℥j. It is employed in the low stage of typhus, and similar cases.

TINCTURA CARDAMOMI.

Tincture of Cardamom.

Tinctura Cardamomi, P.L. 1746, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Cardamoms, bruised, three ounces and a half,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Carminative. Dose, f℥j. to f℥ij. It is generally employed as an adjunct to bitter infusions, but less frequently than the following.

TINCTURA CARDAMOMI COMPOSITA.

Compound Tincture of Cardamom.

Tinctura Stomachica, P.L. 1746.
Tinctura Cardamomi Composita, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Cardamoms,
Caraway, each, bruised, two drachms and a half,
Cochineal, powdered, a drachm,
Cinnamon, bruised, five drachms,
Raisins [stoned] five ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—As the former, and in similar doses.

TINCTURA CASCARILLÆ.

Tincture of Cascarilla.

Tinctura Cascarillæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Cascarilla, bruised, five ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, f℥j. to f℥ij.

TINCTURA CASTOREI.

Tincture of Castor.

Tinctura Castorei, P.L. 1721, P.L. 1746, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Castor, powdered, two ounces and a half,
Rectified Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Antispasmodic. Stimulant. Dose, ♏xx. to f℥ij.

TINCTURA CATECHU.

Tincture of Catechu.

Tinctura Japonica, P.L. 1746.
Tinctura Catechu, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Catechu three ounces and a half,
Cinnamon, bruised, two ounces and a half,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Astringent. Dose, f℥j. to f℥iij. It is a very useful and grateful adjunct to Mistura Cretæ in diarrhœa.

TINCTURA CINCHONÆ.

Tincture of Cinchona.

Tinctura Corticis Peruviani Simplex, P.L. 1746.
Tinctura Corticis Peruviani, P.L. 1788.
Tinctura Cinchonæ, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Heart-leaved Cinchona, bruised, eight ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, f℥j. to f℥iij. It is principally used in mixtures, with the Infusion or Decoction of Cinchona.

TINCTURA CINCHONÆ COMPOSITA.

Compound Tincture of Cinchona.

Tinctura Corticis Peruviani Composita, P.L. 1788.
Tinctura Cinchonæ Composita, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Lance-leaved Cinchona, bruised, four ounces,
Orange Peel, dried, three ounces,
Serpentary, bruised, six drachms,
Saffron two drachms,
Cochineal, powdered, a drachm,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, f℥j. to f℥iij. It contains considerably less cinchona than the simple tincture, but is rendered more grateful by the admixture of the bitters and aromatics.

TINCTURA CINNAMOMI.

Tincture of Cinnamon.

Tinctura Cinnamomi, P.L. 1746, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Cinnamon, bruised, three ounces and a half,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—See Tinctura Cinnamomi Composita.

TINCTURA CINNAMOMI COMPOSITA.

Compound Tincture of Cinnamon.

Tinctura Aromatica, P.L. 1746.
Tinctura Cinnamomi Composita, P.L. 1788,
P.L. 1809, P.L. 1824.

Take of Cinnamon, bruised, an ounce,
Cardamoms, bruised, half an ounce,
Long Pepper, powdered,
Ginger, sliced, each two drachms and a half,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—This and the former are both stomachic and astringent. Dose, f℥j. to f℥ij.

TINCTURA COLCHICI.

Tincture of Meadow Saffron.

Take of Meadow Saffron Seeds, bruised, five ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—In rheumatism and gout. Dose, ♏xx. to ♏xxx.

TINCTURA COLCHICI COMPOSITA.

Compound Tincture of Meadow Saffron.

Spiritus Colchichi Ammoniatus, P.L. 1824, edit. alt.

Take of Meadow Saffron Seeds, bruised, five ounces,
Aromatic Spirit of Ammonia two pints ;
Macerate for fourteen days, and strain.

Medicinal Uses.—Diuretic. Dose, ♏xx. to ♏xxx. in water. The substances enumerated as incompatible with the Spiritus Ammoniæ Aromaticus, are also such with this preparation.

TINCTURA CONII.

Tincture of Hemlock.

Take of Hemlock Leaves, dried, five ounces,
Cardamoms, bruised, an ounce,
Proof Spirit two pints ;
Macerate for fourteen days, and strain.

Medicinal Uses.—Narcotic and Antispasmodic. Dose, fʒss. to fʒj.

TINCTURA CUBEBÆ.

Tincture of Cubeb.

Take of Cubebs, bruised, five ounces,
Rectified Spirit two pints ;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Internally taken in cases of gonorrhœa. Dose, fʒss. to fʒj.

TINCTURA DIGITALIS.

Tincture of Foxglove.

Tinctura Digitalis, P.L. 1809, P.L. 1824.

Take of Foxglove Leaves, dried, four ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Diuretic. Sedative. Dose, ♏x. to ♏xl., gradually increased. If it occasion vomiting or purging, its diuretic powers will be lost, which may be prevented by the use of a small quantity of opium.

TINCTURA GALLÆ.

Tincture of Gall.

Take of Galls, bruised, five ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Astringent. Dose, ♏xx. to f℥ij. It is principally employed as a chemical re-agent for the detection of metals in solution, especially of iron. It contains gallic and tannic acids.

TINCTURA GENTIANÆ COMPOSITA.

Compound Tincture of Gentian.

Tinctura Amara, P.L. 1746.
Tinctura Gentianæ Composita, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Gentian, sliced, two ounces and a half,
Orange Peel, dried, ten drachms,
Cardamoms, bruised, five drachms,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, f℥j. to f℥ij. It is most advantageously exhibited in combination with the Infusum Gentianæ Compositum.

TINCTURA GUAIACI.

Tincture of Guaiacum.

Tinctura Guaiaci, P.L. 1809, P.L. 1824.

Take of Guaiacum Resin, bruised, seven ounces,
Rectified Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Diaphoretic. Dose, fʒj. to fʒiij. When mixed with water the guaiacum is precipitated; it should therefore be exhibited in mixture with some mucilage, or with yelk of egg.

TINCTURA GUAIACI COMPOSITA.

Compound Tincture of Guaiacum.

Tinctura Guaiacina Volatilis, P.L. 1746.
Tinctura Guaiaci, P.L. 1788.
Tinctura Guaiaci Ammoniata, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Guaiacum Resin, bruised, seven ounces,
Aromatic Spirit of Ammonia two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Diaphoretic. Dose, fʒss. to fʒj. This is a more powerful preparation than the simple tincture, on account of the presence of ammonia. Like the simple tincture it is decomposed by water, and must therefore be exhibited with similar precautions.

It is incompatible with acids, and with acidulous, earthy, and metallic salts.

TINCTURA HELLEBORI.

Tincture of Hellebore.

Tinctura Hellebori, P.L. 1721.
Tinctura Melampodii, P.L. 1746.
Tinctura Hellebori Nigri, P.L. 1788,
P.L. 1809, P.L. 1824.

Take of Hellebore, bruised, five ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Emmenagogue, Dose, ♏xxx. to f℥j.

TINCTURA HYOSCYAMI.

Tincture of Henbane.

Tinctura Hyoscyami, P.L. 1809, P.L. 1824.

Take of Henbane Leaves, dried, five ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Narcotic. Dose, f℥ss. to f℥ij. It is stated to procure sleep without affecting the head, or producing the costiveness which opium is apt to do.

TINCTURA IODINII COMPOSITA.

Compound Tincture of Iodine.

Take of Iodine an ounce,
Iodide of Potassium two ounces,
Rectified Spirit two pints;
Macerate until they are dissolved, and strain.

Medicinal Uses.—See Potassii Iodidum. Dose, ♏x. to f℥j.

TINCTURA JALAPÆ.

Tincture of Jalap.

Tinctura Jalapii, P.L. 1746, P.L. 1788.
Tinctura Jalapæ, P.L. 1809, P.L. 1824.

Take of Jalap, bruised, ten ounces,
Proof Spirit two pints ;
Macerate for fourteen days, and strain.

Medicinal Use.—Carthartic. Dose, f℥j. to f℥ss. It is an efficient medicine, but is rarely administered except as an adjuvant to cathartic combinations.

TINCTURA KINO.

Tincture of Kino.

Tinctura Kino, P.L. 1809, P.L. 1824.

Take of Kino, bruised, three ounces and a half,
Rectified Spirit two pints ;
Macerate for fourteen days, and strain.

Medicinal Use.—Astringent. Dose, fʒj. to fʒij. It is said to be less efficacious than the Tinctura Catechu. According to Vauquelin, Kino contains about 75 per cent. of tannin and peculiar extractive ; the later analysis of Buchner shows that it contains catechucic acid.

TINCTURA LAVANDULÆ COMPOSITA.

Compound Tincture of Lavender.

Spiritus Lavendulæ Compositus Matthiæ, P.L. 1721.
Spiritus Lavendulæ Compositus, P.L. 1746.
Tinctura Lavendulæ Composita, P.L. 1788.
Spiritus Lavendulæ Compositus, P.L. 1788, edit. alt.
Spiritus Lavandulæ Compositus, P.L. 1809, P.L. 1824.

Take of Spirit of Lavender a pint and a half,
Spirit of Rosemary half a pint,
Cinnamon, bruised,
Nutmegs, bruised, each two drachms and a half,
Red Saunders, sliced, five drachms;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Stomachic, in languors, &c. Dose, from f℥ss. to f℥ij. in water or any convenient liquid.
Pharmacopœia Preparation.—Liquor Potassæ Arsenitis.

TINCTURA LUPULI.

Tincture of Hop.

Tinctura Humuli, P.L. 1809, P.L. 1824.

Take of Hops six ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Sedative. Tonic. Dose, from f℥ss. to f℥ij. Its powers are questionable as a narcotic, but are stomachic.

TINCTURA MYRRHÆ.

Tincture of Myrrh.

Tinctura Myrrhæ Simplex, P.L. 1721.
Tinctura Myrrhæ, P.L. 1746, P.L. 1788,
P.L. 1809, P.L. 1824.

Take of Myrrh, bruised, three ounces,
Rectified Spirit two pints;
Macerate for fourteen days, and strain.

Pharmacopœia Preparation.—Tinctura Aloës Composita.

Medicinal Uses.—Tonic. Deobstruent. Dose, f ʒss. to f ʒj. It is, however, rarely used internally, but is employed as an external application to foul ulcers, and when diluted with water as a lotion for spongy gums. It is decomposed, and its resin precipitated, by mixture with water.

TINCTURA OPII.

Tincture of Opium.

Tinctura Opii, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Hard Opium, powdered, three ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Qualities—This tincture is of a deep brownish red colour, and possesses the peculiar odour and taste of the opium itself. Its specific gravity I find to be about 0·952, when prepared with proof spirit, as directed in the Pharmacopœia; about 19 minims contain one grain of opium; this was proved by boiling down the tincture, and also by determining the quantity of opium left undissolved. It will appear from what has already

been stated, that proof spirit is a much better solvent of opium than cold water; for the latter dissolves less than 3-7ths of the opium, whereas proof spirit, as I found in preparing the tincture, dissolves more than 2-3rds of it.

Incompatibles.—This tincture is decomposed by ammonia, potash, and soda, and their carbonates, morphia being precipitated; most metallic salts, and tincture of galls, also decompose it.

Pharmacopœia Preparations.—Enema Opii, Linimentum Opii.

Medicinal Use.—Narcotic. As 19 minims contain one grain of opium, the quantity exhibited must depend upon that of the opium which it is intended to give. Its dose is generally stated to be from ♏x. to ♏lx. It is given in preference to opium in substance, in cases of accident or of sudden and extreme pain; it is sometimes preferred to solid opium in chronic cases, on account of the facility with which the dose may be apportioned and varied according to circumstances. It is externally employed as an anodyne in lotions.

TINCTURA RHEI COMPOSITA.

Compound Tincture of Rhubarb.

Tinctura Rhabarbari Composita, P.L. 1788.
Tinctura Rhei Composita, P.L. 1809, P.L. 1824.

Take of Rhubarb, sliced, two ounces and a half,
Liquorice, bruised, six drachms,
Ginger, sliced,
Saffron, each three drachms,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Purgative. Stomachic. Dose, f℥ij. to f℥jss.

TINCTURA SCILLÆ.

Tincture of Squill.

Tinctura Scillæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Squill, fresh-dried, five ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Expectorant. Diuretic. Dose, ♏x. to ♏xxx.

TINCTURA SENNÆ COMPOSITA.

Compound Tincture of Senna.

Elixir Salutis, P.L. 1721.
Tinctura Senæ, P.L. 1746.
Tinctura Sennæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Senna three ounces and a half,
Caraway, bruised, three drachms and a half,
Cardamoms, bruised, a drachm,
Raisins [stoned] five ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stomachic and purgative. Dose, f℥ij. to f℥j.

TINCTURA SERPENTARIÆ.

Tincture of Serpentary.

Tinctura Serpentariæ Virginianæ, P.L. 1721.
Tinctura Serpentariæ, P.L. 1746, P.L. 1788,
P.L. 1809, P.L. 1824.

Take of Serpentary, bruised, three ounces and a half,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Diaphoretic. Dose, f℥i. to f℥iij.

TINCTURA VALERIANÆ.

Tincture of Valerian.

Tinctura Valerianæ Simplex, P.L. 1746.
Tinctura Valerianæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Valerian, bruised, five ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Antispasmodic. Dose, from f℥i. to f℥iij. It is seldom employed except as an adjunct to the Infusion of Valerian.

TINCTURA VALERIANÆ COMPOSITA.

Compound Tincture of Valerian.

Tinctura Valerianæ Volatilis, P.L. 1746, P.L. 1788.
Tinctura Valerianæ Ammoniata, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Valerian, bruised, five ounces,
Aromatic Spirit of Ammonia two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Antispasmodic. Dose, f℥ss. to f℥j. It is more powerful than the simple tincture, only on account of the ammonia which it contains. It is incompatible with acids, and with acidulous, metallic, and earthy salts.

TINCTURA ZINGIBERIS.

Tincture of Ginger.

Tinctura Zingiberis, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Ginger, sliced, two ounces and a half,
Rectified Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Carminative. Dose, f℥i. to f℥ij. It is useful in gout when it attacks the stomach, and in flatulent colic, and as a corrigent to griping purgatives.

VEGETABILIA.

VEGETABLES.

Vegetables are to be collected in dry weather, when wet neither with showers nor dew; they are to be collected annually, and those which have been kept longer are to be rejected.

Most Roots are to be dug up before the stalks or leaves appear.

Barks ought to be collected at that season in which they can most easily be separated from the wood.

Leaves are to be gathered after the flowers are blown, and before the seeds ripen.

Flowers are to be gathered recently blown.

Seeds are to be collected when ripe, and are to be kept in their own seed-vessels.

VEGETABILIUM PRÆPARATIO.

THE PREPARATION OF VEGETABLES.

Vegetables shortly after they have been gathered, those excepted which ought to be fresh, are to be lightly strewed, and dried as quickly as possible, with a gentle heat; keep them afterwards in proper vessels, excluded from the access of light and moisture.

Lay up those Roots which we have directed to be kept fresh, in dry sand. Cut the Cormus of Meadow Saffron and the Bulb of the Squill, before drying, transversely into thin slices, the dry rind being previously pealed off.

Put pulpy fruits, if they are unripe, or if ripe and dry, in a moist place, that they may soften; then press the pulps through a hair sieve; afterwards boil them over a slow fire, frequently stirring; lastly, evaporate the water in a water-bath, until the pulps become of a proper consistence.

Pour boiling water upon the bruised Pods of Cassia, that the pulp may be washed out, which press first through a coarse sieve, and afterwards through a hair one; then evaporate the water in a water-bath, until the pulp acquires a proper consistence.

Press the pulp or juice of ripe and fresh fruits through a sieve, no boiling being used.

GUMMI-RESINÆ.

GUM-RESINS.

Separate Opium from foreign substances, especially the external, as carefully as possible. Let Opium be kept soft, which may be fit to be formed into pills, and hard, which has been so dried in a water-bath, that it may be rubbed to powder.

Those Gum-Resins are to be reckoned best, which are so perfect, that no purification is necessary. But those which appear to be less pure, are to be boiled in water until they soften, and squeezed with a press through a hempen cloth; then to be set by, that the resinous part may subside. The supernatant liquor being poured off, evaporate it in a water-bath, the resinous part being added towards the end, that it may unite with the gummy part.

The Gum-Resins which melt easily, may be purified by putting them into an ox-bladder, and keeping them in boiling water, until they become so soft, that they may

be separated from impurities by a press through a hempen cloth.

Dissolve Storax in rectified spirit, and strain; then let the spirit distil with a gentle heat, until it becomes of a proper consistence.

VINA.

WINES.

Medicated Wines should be prepared in stopped glass vessels, and frequently shaken during maceration.

VINUM ALOËS.

Wine of Aloes.

Tinctura Hieræ, P.L. 1721.
Tinctura Sacra, P.L. 1746.
Vinum Aloës, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Aloes, rubbed to powder, two ounces,
Canella, powdered, four drachms,
Sherry Wine two pints;
Macerate for fourteen days, frequently shaking, and strain.

Medicinal Uses.—Stomachic, in doses of f℥i. to f℥ij. Purgative, f℥i. to f℥ij.

VINUM COLCHICI.

Wine of Meadow Saffron.

Vinum Colchici, P.L. 1824.

Take of Meadow Saffron Cormus, dried, sliced, eight ounces,
Sherry Wine two pints;
Macerate for fourteen days, and strain.

Remarks.—For an account of the nature and properties of *colchicia*, the alkaline and active principle of Meadow Saffron, see Acetum Colchici.

Medicinal Use.—Diuretic. Dose, from ♏︎xxx. to f℥i. It is stated to be a specific in the gout, allaying the pain, and cutting short the paroxysm.

VINUM IPECACUANHÆ.

Wine of Ipecacuanha.

Vinum Ipecacoanhæ, P.L. 1746.
Vinum Ipecacuanhæ, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Ipecacuanha, bruised, two ounces and a half,
Sherry Wine two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Diaphoretic. Dose, ♏︎xx. to ♏︎xl. Emetic. Dose, f℥ij. to f℥iv. It is as efficacious an emetic as Vinum Antimonii Potassio-tartratis, and, being milder in its operation, is better adapted for infants, a teaspoonful or f℥ss. being administered every ten or fifteen minutes till it operates.

The active power of ipecacuanha resides in a peculiar alkali, to which the name of *Emetina* has been given. The root contains about 14 per cent. of it, mixed with woody fibre, starch, gum, &c. Dr. A. T. Thomson (Dispensatory, p. 817,) states, that a pint of sherry takes up 100 grains of the soluble matter of ipecacuanha. Emetina is white when pure, pulverulent, inodorous, with a slightly bitter taste; fusible at 122° F.; very slightly soluble in cold water, much more soluble in hot; readily dissolved by alcohol, but scarcely at all in æther and oils. It restores the

blue colour of reddened litmus, and dissolves in acids, but without entirely destroying their acidity; the salts which it yields are consequently slightly acid; they crystallize easily.

Tincture of Galls precipitates a solution of emetina copiously, as it does of morphia, but emetina is not acted upon by the salts of iron as morphia is.

According to the analysis of MM. Dumas and Pelletier, emetina consists of nearly

Twenty-five eqs. of Hydrogen	$1 \times 25 =$	25 or	7·77
Thirty-five eqs. of Carbon	$6 \times 35 =$	210 „	64·57
Nine eqs. of Oxygen	$8 \times 9 =$	72 „	22·95
One eq. of Azote................		14 „	4·30
Equivalent....		321.	99·59

VINUM OPII.

Wine of Opium.

Laudanum Liquidum Sydenhami, P.L. 1721.
Tinctura Thebaica, P.L. 1746.
Vinum Opii, P.L. 1809, P.L. 1824.

Take of Purified Extract of Opium two ounces and a half,
Cinnamon, bruised,
Cloves, bruised, each two drachms and a half,
Sherry Wine two pints;
Macerate for fourteen days, and strain.

Remarks.—This preparation differs from the Tinctura Opii, not only in containing aromatics, but also in the use of purified Opium. Various circumstances render it difficult to form an estimate of the comparative powers of these preparations; they probably differ but little, for respectable authorities agree in representing their doses as similar. The Vinum Opii must be less disagreeable to most persons than the tincture, not only on account of the aromatics which it contains, but because the opium during purification loses its peculiar and disagreeable smell and taste.

Medicinal Use.—Narcotic. Dose, ♏x. to f℥i.

VINUM VERATRI.

Wine of White Hellebore.

Vinum Veratri, P.L. 1809, edit. alt., P.L. 1824.

Take of White Hellebore, sliced, eight ounces,
Sherry Wine two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Emetic and cathartic, acting usually with considerable violence. Dose, ℳv. to ℳx. See VERATRIA.

UNGUENTA.

OINTMENTS.

UNGUENTUM ANTIMONII POTASSIO-TARTRATIS.

Ointment of Potassio-tartrate of Antimony.

Take of Potassio-tartrate of Antimony, rubbed to powder, an ounce,
Lard four ounces;
Mix.

Medicinal Use.—Employed in chronic swellings of the joints, particularly after rheumatism.

UNGUENTUM CANTHARIDIS.

Ointment of Cantharides.

Unguentum Cantharidis, P.L. 1788.
Unguentum Lyttæ, P.L. 1809, edit. alt.
Unguentum Cantharidis, P.L. 1824.

Take of Cantharides, rubbed to very fine powder, an ounce,
Distilled Water four fluidounces,
Cerate of Resin four ounces;
Boil down the Water with the Cantharides to half, and strain. Mix the Cerate with the strained liquor; afterwards let it evaporate to a proper consistence.

Medicinal Use.—This is sometimes employed for the same purpose as the Ceratum Cantharidis; it is a milder preparation, and frequently inefficacious.

UNGUENTUM CETACEI.

Ointment of Spermaceti.

Linimentum Album, P.L. 1746.
Unguentum Spermatis Ceti, P.L. 1788.
Unguentum Cetacei, P.L. 1809, P.L. 1824.

Take of Spermaceti six drachms,
White Wax two drachms,
Olive Oil three fluidounces;
Being melted together with a slow fire, stir constantly until they become cold.

Medicinal Use.—There is no difference in the properties of this and the Ceratum Cetacei, excepting that the ointment is softer. They are used for similar purposes.

UNGUENTUM CREASOTI.

Ointment of Creasote.

Take of Creasote half a fluidrachm,
Lard an ounce;
Rub and mix them.

Remarks.—Creasote is a substance now introduced into the Pharmacopœia, which among various other compounds was discovered in 1830 by Reichenbach, in tar. Creasote exists in pyroligneous acid, which is impure acetic acid obtained by the distillation and decomposition of wood; but it is best prepared from those portions of the oil distilled from wood-tar, which are heavier than water; the process is too operose and complicated to admit of detail on the present occasion. See Brande, Turner, &c.

Properties.—Creasote is a colourless, transparent liquid of an oily consistence, which retains its fluidity at 17°. Its sp. gr. is about 1·037; it boils at 397°. Its smell is strong and penetrating, like that of wood smoke, or rather of smoked meat. It is a non-conductor of electricity, refracts light powerfully, and burns with a very sooty flame. Creasote when mixed with water forms two solutions; one consists of 100 water and 1·25 creasote; the other of 100 water and 10 creasote. It combines also, and in all proportions with alcohol, æther, and naphtha. It is highly antiseptic to meat; and the similar virtue of tar, smoke, and crude pyroligneous acid seems to be derived from the presence of creasote; its name, from *κρέας, flesh, σώζω, I save,* was suggested by this property.

Creasote immediately coagulates serum, and a dilute solution of white of egg; it acts energetically upon the animal system; insects and fishes when put into an aqueous solution of creasote are killed by it, and it destroys vegetation. It possesses neither acid nor alkaline properties, but combines both with acids and alkalis, without, however, forming very stable compounds with them; it also unites with some elementary bodies, as chlorine, iodine, sulphur, &c. Creasote is employed in tooth-ache, ulcers, and cutaneous diseases externally, and to check hæmorrhage; and internally as a stimulant, and for the prevention of nausea and vomiting. Its powers have, however, in the opinion of competent judges, been greatly overrated. It is decidedly injurious in inflammatory conditions and structural disease of the stomach, and frequently fails in allaying the sickness dependent on organic dis-

cases, as of the heart and kidneys. Three or four drops added to a pint of ink are said to prevent its becoming mouldy.

According to Ettling, Creasote consists of

Nine equivalents of Hydrogen	$1 \times 9 =$	9	or 8·12
Fourteen equivalents of Carbon......	$6 \times 14 =$	84	„ 77·42
Two equivalents of Oxygen	$8 \times 2 =$	16	„ 14·46
Equivalent....		109.	100·

It is, however, correctly remarked by Mr. Pereira (Materia Medica, p. 228), that the equivalent of creasote must be considered as uncertain, since no definite compound of this substance has been analysed, by which the combining proportion could be ascertained.

Medicinal Use.—Unguentum Creasoti is employed in mild cases of ringworm, and analogous cutaneous diseases.

UNGUENTUM ELEMI.

Ointment of Elemi.

Unguentum e Gummi Elemi sive *Linimentum Arcæi*, P.L. 1721.
Unguentum e Gummi Elemi, P.L. 1746.
Unguentum Elemi, P.L. 1788.
Unguentum Elemi Compositum, P.L. 1788, edit. alt., P.L. 1809, P.L. 1824.

Take of Elemi a pound,
Common Turpentine ten ounces,
Suet two pounds,
Olive Oil two fluidounces;

Melt the Elemi with the Suet; then remove them from the fire, and immediately mix with them the Turpentine and the Oil; afterwards press through a linen cloth.

Medicinal Use.—Stimulant and digestive. It is used to keep open setons and issues, and as an application to ulcers which do not admit of the use of adhesive straps.

UNGUENTUM GALLÆ COMPOSITUM.

Compound Ointment of Gall.

Take of Galls, rubbed to very fine powder, two drachms,
Lard two ounces,
Hard Opium, powdered, half a drachm;
Mix.

Medicinal Use.—Astringent. Used in hæmorrhoidal affections.

UNGUENTUM HYDRARGYRI FORTIUS.

Stronger Ointment of Mercury.

Unguentum Cœruleum, P.L. 1721.
Unguentum Cœruleum Fortius, P.L. 1746.
Unguentum Hydrargyri Fortius, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Mercury two pounds,
Lard twenty-three ounces,
Suet an ounce;
First rub the Mercury with the Suet and a little of the Lard until globules can no longer be seen; then add that which is left of the Lard, and mix.

Process.—During trituration with the fatty matter, the mercury is probably reduced to the same state as that in which it exists in the Pilulæ Hydrargyri.

Remarks.—As the preparation of this ointment is an exceedingly tedious operation, various means, and most of them of an objectionable nature, have been resorted to in order to shorten it. Some employ Oleum Sulphuratum, a preparation not contained in the present Pharmacopœia; the use of this, from the well-known power of sulphur in diminishing the effects of mercury, ought always to be reprobated. By others, turpentine is used on account of its tenacity; but this is apt to produce pustules, which prevent the continuance of the friction. I have been assured that the admixture of a portion of old ointment greatly facilitates the operation. The ointment contains half its weight of mercury.

Pharmacopœia Preparations.—Ceratum Hydrargyri Compositum, Linimentum Hydrargyri Compositum, Unguentum Hydrargyri Mitius.

Medicinal Use.—This ointment furnishes a prompt and probably one of the least exceptionable modes of introducing mercury into the system. It is generally applied by rubbing ʒss. to ʒi. on some part of the body where the cuticle is thin, generally in syphilitic cases, on the inside of the thigh; in chronic hepatitis it is usually applied in the region of the liver.

UNGUENTUM HYDRARGYRI MITIUS.

Milder Ointment of Mercury.

Unguentum Cœruleum Mitius, P.L. 1746.
Unguentum Hydrargyri Mitius, P.L. 1788, P.L. 1809, P.L. 1824.

Take of the Stronger Ointment of Mercury a pound,
Lard two pounds;
Mix.

Medicinal Use.—This is used as a dressing, and for those purposes in which the preceding preparation would be too powerful. Six drachms contain one drachm of mercury.

UNGUENTUM HYDRARGYRI NITRATIS.

Ointment of Nitrate of Mercury.

Unguentum Hydrargyri Nitrati, P.L. 1788.
Unguentum Hydrargyri Nitratis, P.L. 1809, P.L. 1824.

Take of Mercury an ounce,
Nitric Acid eleven fluidrachms,
Lard six ounces,
Olive Oil four fluidounces;

First dissolve the Mercury in the Acid; then mix the solution while hot with the Lard and Oil melted together.

Process.—The action of dilute nitric acid on mercury has been explained when treating of Hydrargyri Nitrico-oxydum; it is similar in the present case in nature, but differs in degree; thus when the nitric acid is dilute, only so much suffers decomposition as is required to convert the mercury into protoxide; but when it is concentrated, then twice as much is decomposed, and we procure binoxide of mercury, which the acid, remaining undecomposed, dissolves and converts into a solution of nitrate of binoxide of mercury, or pernitrate of mercury; this is mixed with the melted lard to form the Unguentum Hydrargyri Nitratis.

Medicinal Use.—Stimulant and detergent. When its strength is diminished by the addition of lard, it is a local remedy of great efficacy in eruptions and various cutaneous diseases.

UNGUENTUM HYDRARGYRI NITRICO-OXYDI.

Ointment of Nitric-oxide of Mercury.

Unguentum Hydrargyri Nitrico-oxydi, P.L. 1809, P.L. 1824.

Take of Nitric-oxide of Mercury an ounce,
White Wax two ounces,
Lard six ounces;

Add the Nitric-oxide of Mercury, rubbed to very fine powder, to the Wax and Lard, melted together, and mix.

Medicinal Use.—This is applied in the same manner, and for similar purposes, as the preceding ointment.

UNGUENTUM HYDRARGYRI IODIDI.

Ointment of Iodide of Mercury.

Take of Iodide of Mercury an ounce,
White Wax two ounces,
Lard six ounces;

Add the Iodide of Mercury to the Wax and Lard melted together, and mix.

Medicinal Use.—Used for dressing to scrofulous sores.

UNGUENTUM HYDRARGYRI BINIODIDI.

Ointment of Biniodide of Mercury.

Take of Biniodide of Mercury an ounce,
White Wax two ounces,
Lard six ounces;

Add the Biniodide of Mercury to the Wax and Lard melted together, and mix.

Medicinal Use.—A more active preparation than the former, and employed in analogous cases.

UNGUENTUM HYDRARGYRI AMMONIO-CHLORIDI.

Ointment of Ammonio-chloride of Mercury.

Unguentum e Mercurio Præcipitato, P.L. 1746.
Unguentum Calcis Hydrargyri Albæ, P.L. 1788.
Unguentum Hydrargyri Præcipitati Albi, P.L. 1809, P.L. 1824.

Take of Ammonio-chloride of Mercury a drachm,
Lard an ounce and a half;

Add the Ammonio-chloride of Mercury to the Lard, melted over a slow fire, and mix.

Medicinal Uses.—Stimulant and detergent.

UNGUENTUM IODINII COMPOSITUM.

Compound Ointment of Iodine.

Take of Iodine half a drachm,
Iodide of Potassium a drachm,
Rectified Spirit a fluidrachm,
Lard two ounces;
First rub the Iodine and Iodide of Potassium with the Spirit, then mix with the Lard.

Medicinal Use.—Employed in bronchocele.

UNGUENTUM PICIS LIQUIDÆ.

Ointment of Liquid Pitch [Tar].

Unguentum e Pice, P.L. 1746.
Unguentum Picis, P.L. 1788.
Unguentum Picis Liquidæ, P.L. 1809, P.L. 1824.

Take of Liquid Pitch [Tar],
Suet, each a pound;
Melt them together, and press through a linen cloth.

Medicinal Uses.—This ointment is employed for the removal of tetter, and in tinea capitis.

UNGUENTUM PICIS NIGRÆ.

Ointment of Black Pitch.

Unguentum Basilicum Nigrum vel
Unguentum Tetrapharmacum, P.L. 1746.
Unguentum Picis Aridæ, P.L. 1809.
Unguentum Resinæ Nigræ, P.L. 1809, edit. alt.
Unguentum Picis Nigræ, P.L. 1824.

Take of Black Pitch,
Wax,
Resin, each nine ounces,
Olive Oil, sixteen fluidounces;
Melt them together, and press through a linen cloth.

Medicinal Uses.—Digestive and stimulant.

UNGUENTUM PLUMBI COMPOSITUM.

Compound Ointment of Lead.

Take of Prepared Chalk eight ounces,
Distilled Vinegar six fluidounces,
Plaster of Lead three pounds,
Olive Oil a pint;
Melt the Plaster in the Oil with a slow fire; then gradually add the Chalk separately mixed with the Vinegar, the effervescence being finished, and stir constantly until they are cooled.

Medicinal Use.—Employed as a dressing to indolent ulcers.

UNGUENTUM PLUMBI IODIDI.

Ointment of Iodide of Lead.

Take of Iodide of Lead an ounce,
Lard eight ounces;
Rub together, and mix.

Medicinal Use.—Employed in chronic enlargement of joints.

UNGUENTUM SAMBUCI.

Ointment of Elder.

Unguentum Sambucinum, P.L. 1721, P.L. 1746.
Unguentum Sambuci, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Elder [Flowers],
Lard, each two pounds;
Boil the Elder flowers in the Lard until they become crisp; then press through a linen cloth.

Medicinal Use.—This is employed for the same purposes as the Unguentum Cetacei, over which it possesses no advantage but a pleasant smell.

UNGUENTUM SULPHURIS.

Ointment of Sulphur.

Unguentum e Sulphure, P.L. 1746.
Unguentum Sulphuris, P.L. 1788, P.L. 1809, P.L. 1824.

Take of Sulphur three nunces,
Lard half a pound,
Oil of Bergamot twenty minims;
Mix.

UNGUENTUM SULPHURIS COMPOSITUM.

Compound Ointment of Sulphur.

Unguentum Sulphuris Compositum, P.L. 1809, P.L. 1824.

Take of Sulphur half a pound,
White Hellebore, powdered, two ounces,
Nitrate of Potash a drachm,
Soft Soap half a pound,
Lard a pound and a half,
Oil of Bergamot thirty minims;
Mix.

Medicinal Use.—This and the last ointment are used for the cure of the itch; the compound ointment sometimes excites too much irritation.

UNGUENTUM VERATRI.

Ointment of White Hellebore.

Unguentum Hellebori Albi, P.L. 1788.
Unguentum Veratri, P.L. 1809, P.L. 1824.

Take of White Hellebore, powdered, two ounces,
Lard eight ounces,
Oil of Lemons twenty minims;
Mix.

Medicinal Use.—This is used for the cure of scabies, but is said to be less certain in its effects than the Sulphur Ointment.

UNGUENTUM ZINCI.

Ointment of Zinc.

Unguentum Zinci, P.L. 1809, P.L. 1824.

Take of Oxide of Zinc an ounce,
Lard six ounces;
Mix.

Medicinal Use.—This may be considered as an improvement upon the Ceratum Calaminæ. It is recommended as being very useful in some species of ophthalmia, smeared upon the tarsi every night.

EXPLANATION OF THE MODE OF EMPLOYING SYMBOLS.

A capital letter, as C for carbon, or a capital followed by a small letter, as Ca for calcium, express one equivalent of an elementary body, or of any compound body which is considered as acting the part of an element, as Cy for cyanogen, &c.

A capital letter followed by another without any stop, expresses a compound of one equivalent of each element, represented by those letters: thus C is carbon, and O is oxygen, both elements, and CO means one eq. of carbon, combined with one eq. of oxygen, or oxide of carbon.

Many binary compounds contain one eq. of one element, and more than one of the other: this happens with respect to the compounds of carbon and oxygen; thus while CO, as already mentioned, is a compound of one eq. of carbon and one eq. of oxygen, carbonic acid is composed of one eq. of carbon, and two eqs. of oxygen: the number of eqs. of oxygen is represented by placing a small raised figure to the right hand of its symbol, thus, O^2; CO^2 then is carbonic acid, composed of one eq. of carbon and 2 eqs. of oxygen; oxalic acid is another compound of carbon and oxygen; this consists of two eqs. of carbon, and three eqs. of oxygen; this is represented by C^2O^3.

More than one equivalent of that element only, which is represented by the first letter or symbol, may enter into a compound. In this case the same rule is followed: thus, CuO is a compound of one eq. of copper, and one eq. of oxygen, it is the black oxide of copper; but Cu^2O is a compound of two eqs. of copper, and one eq. of oxygen, or it is the dinoxide of copper, whereas CuO^2 would represent binoxide of copper, if such a compound were to be discovered.

S represents one eq. of sulphur, but sulphuric acid,

being a compound of one eq. of sulphur and three eqs. of oxygen, is represented by SO^3; to express sulphate of oxide of copper, usually called sulphate of copper, we write CuO, SO^3, merely placing a comma between the two binary compounds; but crystallized sulphate of copper, (or blue vitriol,) contains five eqs. of water; now water is composed of one eq. of hydrogen H, and one eq. of oxygen O, and, according to the rule already mentioned, water is written HO; but this being a compound body, the number of equivalents, instead of being expressed by a small raised figure on the right, is designated by a large figure on the left, thus, 5HO.

It also happens that different oxides combine, and that different salts enter into combination, and that different numbers of equivalents of each also unite; thus protoxide of iron is FeO, peroxide is Fe^2O^3, this is commonly considered as a sesquioxide and written $FeO^{1\frac{1}{2}}$, and the black or magnetic oxide consists of one eq. of protoxide, and two eqs. of sesquioxide; this compound is expressed by $FeO, 2FeO^{1\frac{1}{2}}$.

Again; alum is composed of one eq. of sulphate of potash, three eqs. of sulphate of alumina, and twenty-five eqs. of water; this double salt is thus symbolically written with a semicolon after each simple salt:

$$KO, SO^3;\ 3(AlO, SO^3);\ 25HO.$$

On the other hand, $3AlO, SO^3$, without a parenthesis, means three eqs. of alumina, and one eq. of sulphuric acid, or one eq. of trisulphate of alumina; $AlO, 3SO^3$, expresses a compound of one eq. of alumina and three eqs. of sulphuric acid, or one eq. of tersulphate of alumina.

When also it is required to express more than one eq. of a salt, the salts are placed between parentheses thus, $2(KO, SO^3)$ expresses two eqs. of sulphate of potash, and $2(KO, 2SO^3)$ two eqs. of bisulphate of potash.

A TABLE

OF

ELEMENTS AND SYMBOLS.

Aluminium	Al.	
Antimony	Sb.	(Stibium.)
Arsenic	As.	
Azote	N.	(Nitrogen.)
Barium	Ba.	
Bismuth	Bi.	
Boron	B.	
Bromine	Br.	
Cadmium	Cd.	
Calcium	Ca.	
Carbon	C.	
Cerium	Ce.	
Chlorine	Cl.	
Chromium	Cr.	
Cobalt	Co.	
Columbium	Ta.	(Tantalum.)
Copper	Cu.	(Cuprum.)
Fluorine	F.	
Glucinium	G.	
Gold	Au.	(Aurum.)
Hydrogen	H.	
Iodine	I.	
Iridium	Ir.	
Iron	Fe.	(Ferrum.)
Lantanium	La.	
Lead	Pb.	(Plumbum.)
Lithium	L.	
Magnesium	Mg.	
Manganese	Mn.	
Mercury	Hg.	(Hydrargyrum.)
Molybdenum	Mo.	
Nickel	Ni.	
Osmium	Os.	
Oxygen	O.	
Palladium	Pd.	
Phosphorus	P.	
Platina	Pt.	
Potassium	K.	(Kalium.)
Rhodium	R.	
Selenium	Se.	
Silicium or Silicon	Si.	
Silver	Ag.	(Argentum.)
Sodium	Na.	(Natrium.)
Strontium	Sr.	
Sulphur	S.	
Tellurium	Te.	
Thorium	Th.	
Tin	Sn.	(Stannum.)
Titanium	Ti.	
Tungsten	W.	(Wolfram.)
Uranium	U.	
Vanadium	V.	
Yttrium	Y.	
Zinc	Zn.	
Zirconium	Zr.	

A TABLE

OF

SYMBOLS AND ELEMENTS.

Ag	Silver.	Mo	Molybdenum.
Al	Aluminium.	N	Azote.
As	Arsenic.	Na	Sodium.
Au	Gold.	Ni	Nickel.
B	Boron.	O	Oxygen.
Ba	Barium.	Os	Osmium.
Bi	Bismuth.	P	Phosphorus.
Br	Bromine.	Pb	Lead.
C	Carbon.	Pd	Palladium.
Ca	Calcium.	Pt	Platina.
Cd	Cadmium.	R	Rhodium.
Ce	Cerium.	S	Sulphur.
Cl	Chlorine.	Sb	Antimony.
Co	Cobalt.	Si	Silicium, or Silicon.
Cr	Chromium.	Se	Selenium.
Cu	Copper.	Sn	Tin.
F	Fluorine.	Sr	Strontium.
Fe	Iron.	Ta	Columbium.
G	Glucinium.	Te	Tellurium.
H	Hydrogen.	Th	Thorium.
Hg	Mercury.	Ti	Titanium.
I	Iodine.	U	Uranium.
Ir	Iridium.	V	Vanadium.
K	Potassium.	W	Tungsten.
L	Lithium.	Y	Yttrium.
La	Lantanium.	Zn	Zinc.
Mg	Magnesium.	Zr	Zirconium.
Mn	Manganese.		

A TABLE

OF

EQUIVALENTS.

Acid, Acetic (anhydrous)	3 Hydrogen ....(1 × 3) =	3	51
	4 Carbon ....(6 × 4) =	24	
	3 Oxygen ....(8 × 3) =	24	
——, Acetic (glacial)	1 Anhydrous Acid .... =	51	60
	1 Water .... =	9	
——, Antimonious	1 Antimony .... =	65	81
	2 Oxygen ....(8 × 2) =	16	
——, Antimonic	1 Antimony .... =	65	85
	2½ Oxygen .... =	20	
——, Arsenious	1 Arsenic .... =	38	50
	1½ Oxygen........................ =	12	
——, Arsenic	1 Arsenic .... =	38	58
	2½ Oxygen .... =	20	
——, Benzoic (anhydrous)	5 Hydrogen ....(1 × 5) =	5	113
	14 Carbon ....(6 × 14) =	84	
	3 Oxygen ....(8 × 3) =	24	
——, Benzoic (crystallized)	1 Anhydrous Acid .... =	113	122
	1 Water .... =	9	
——, Boracic (anhydrous)	1 Boron .... =	20	68
	6 Oxygen ....(8 × 6) =	48	
——, Boracic (crystallized)	1 Anhydrous Acid .... =	68	122
	6 Water..................(9 × 6) =	54	
——, Bromic	1 Bromine .... =	78	118
	5 Oxygen ....(8 × 5) =	40	
——, Carbonic	1 Carbon .... =	6	22
	2 Oxygen ....(8 × 2) =	16	
——, Chloric	1 Chlorine .... =	36	76
	5 Oxygen ....(8 × 5) =	40	
——, Citric (anhydrous) .	2 Hydrogen ....(1 × 2) =	2	58
	4 Carbon ....(6 × 4) =	24	
	4 Oxygen ....(8 × 4) =	32	
——, Citric (crystallized)	1 Anhydrous Acid .... =	58	70
	1⅓ Water .... =	12	
——, Gallic (anhydrous) .	3 Hydrogen ....(1 × 3) =	3	85
	7 Carbon ....(6 × 7) =	42	
	5 Oxygen ....(8 × 5) =	40	

Acid, Gallic (crystallized)	1 Anhydrous Acid		85	94
	1 Water		9	
——, Hydriodic	1 Iodine		126	127
	1 Hydrogen		1	
——, Hydrobromic	1 Bromine		78	79
	1 Hydrogen		1	
——, Hydrochloric (gaseous)	1 Chlorine		36	37
	1 Hydrogen		1	
——, Hydrocyanic (anhydrous)	1 Cyanogen		26	27
	1 Hydrogen		1	
——, Hydrosulphuric (gaseous)	1 Sulphur		16	17
	1 Hydrogen		1	
——, Hyponitrous	1 Azote		14	38
	3 Oxygen	(8 × 3)	24	
——, Hypophosphorous	2 Phosphorus	(16 × 2)	32	40
	1 Oxygen		8	
——, Hyposulphuric	2 Sulphur	(16 × 2)	32	72
	5 Oxygen	(8 × 5)	40	
——, Hyposulphurous	2 Sulphur	(16 × 2)	32	48
	2 Oxygen	(8 × 2)	16	
——, Kinic (anhydrous)	10 Hydrogen	(1 × 10)	10	180
	15 Carbon	(6 × 15)	90	
	10 Oxygen	(10 × 8)	80	
——, Kinic (crystallized)	1 Anhydrous Acid		180	189
	1 Water		9	
——, Lactic (crystallized)	4 Hydrogen	(1 × 4)	4	72
	6 Carbon	(6 × 6)	36	
	4 Oxygen	(8 × 4)	32	
——, Lithic	2 Hydrogen	(1 × 2)	2	84
	5 Carbon	(6 × 5)	30	
	3 Oxygen	(8 × 3)	24	
	2 Azote	(14 × 2)	28	
——, Meconic	2 Hydrogen	(1 × 2)	2	100
	7 Carbon	(6 × 7)	42	
	7 Oxygen	(8 × 7)	56	
——, Nitric (anhydrous)	1 Azote		14	54
	5 Oxygen	(8 × 5)	40	
——, Nitric (sesquihydrate) sp. gr. 1·5	1 Anhydrous Acid		54	67·5
	1½ Water		13·5	
——, Nitrous	1 Azote		14	46
	4 Oxygen	(8 × 4)	32	
——, Oxalic (anhydrous)	2 Carbon	(6 × 2)	12	36
	3 Oxygen	(8 × 3)	24	
——, Oxalic (crystallized)	1 Anhydrous Acid		36	63
	3 Water	(9 × 3)	27	
——, Oxichloric	1 Chlorine		36	92
	7 Oxygen	(8 × 7)	56	
——, Phosphoric	1 Phosphorus		16	36
	2½ Oxygen		20	
——, Phosphorus	1 Phosphorus		16	28
	1½ Oxygen		12	
——, Succinic (anhydrous)	2 Hydrogen	(1 × 2)	2	50
	4 Carbon	(6 × 4)	24	
	3 Oxygen	(8 × 3)	24	

Acid, Succinic (crystallized)	1 Anhydrous Acid	=	50	59
	1 Water	=	9	
——, Sulphovinic	2 Sulphuric Acid......(40 × 2)	=	80	126
	6 Hydrogen ....(1 × 6) = 2 Alc.	=	6	
	4 Carbon (6 × 4)	=	24	
	2 Oxygen ....(8 × 2)	=	16	
——, Sulphuric (anhydrous)	1 Sulphur	=	16	40
	3 Oxygen ....(8 × 3)	=	24	
——, Sulphuric (liquid) sp. gr. 1·845	1 Anhydrous Acid	=	40	49
	1 Water	=	9	
——, Sulphurous	1 Sulphur	=	16	32
	2 Oxygen ....(8 × 2)	=	16	
——, Tannic	8 Hydrogen ....(1 × 8)	=	8	212
	18 Carbon ....(6 × 18)	=	108	
	12 Oxygen ....(8 × 12)	=	96	
——, Tartaric (anhydrous)	2 Hydrogen ....(1 × 2)	=	2	66
	4 Carbon ....(6 × 4)	=	24	
	5 Oxygen ....(8 × 5)	=	40	
——, Tartaric (crystallized)	1 Anhydrous Acid	=	66	75
	1 Water	=	9	
Æther, Hyponitrous	1 Hyponitrous Acid	=	38	75
	1 Æther	=	37	
———, Sulphuric	5 Hydrogen = Eth^m (1 × 5)	=	5	37
	4 Carbon (6 × 4)	=	24	
	1 Oxygen	=	8	
Æthereal Oil	1 Sulphuric Acid	=	40	77
	1 Æther (or Oxide of Ethereum)	=	37	
Alcohol	3 Hydrogen ....(1 × 3)	=	3	23
	2 Carbon ....(6 × 2)	=	12	
	1 Oxygen	=	8	
Alum, Ammonia (crystallized)	3 Sulphate of Alumina (58 × 3)	=	174	456
	1 Sulphate of Ammonia	=	57	
	25 Water ....(9 × 25)	=	225	
——, Potash (crystallized)	3 Sulphate of Alumina (58 × 3)	=	174	487
	1 Sulphate of Potash	=	88	
	25 Water ....(9 × 25)	=	225	
——, Soda (crystallized)	3 Sulphate of Alumina (58 × 3)	=	174	471
	1 Sulphate of Soda	=	72	
	25 Water ....(9 × 25)	=	225	
Alumina	1 Aluminium	=	10	18
	1 Oxygen	=	8	
Alumina, Sulphate	1 Alumina	=	18	58
	1 Sulphuric Acid	=	40	
Aluminium				10
Ammonia	1 Azote	=	14	17
	3 Hydrogen ....(1 × 3)	=	3	
Ammonia, Acetate	1 Acetic Acid		51	68
	1 Ammonia		17	
————, Bicarbonate (hydrated)	2 Carbonic Acid ......(22 × 2)	=	44	79
	1 Ammonia	=	17	
	2 Water ....(9 × 2)	=	18	
————, Carbonate	1 Carbonic Acid	=	22	39
	1 Ammonia	=	17	

Ammonia, Sesquicarbonate (hydrated)	1½ Carbonic Acid	= 33	59
	1 Ammonia	= 17	
	1 Water	= 9	
———, Hydrochlorate	1 Ammonia	= 17	54
	1 Hydrochloric Acid	= 37	
———, Nitrate	1 Ammonia	= 17	80
	1 Nitric Acid	= 54	
	1 Water	= 9	
———, Sulphate	1 Ammonia	= 17	75
	1 Sulphuric Acid	= 40	
	2 Water (9 × 2)	= 18	
Antimony			65
———, Oxysulphuret	1 Sesquioxide of Antimony	= 77	594
	5 Sesquisulphuret of Antimony (89 × 5)	= 445	
	8 Water (9 × 8)	= 72	
———, Potassio-tartrate	1 Tartrate Potash	= 114	361
	1 Ditartrate Antimony	= 220	
	3 Water (9 × 3)	= 27	
———, Sesquioxide	1 Antimony	= 65	77
	1½ Oxygen	= 12	
———, Sesquisulphuret	1 Antimony	= 65	89
	1½ Sulphur	= 24	
Arsenic			38
Atropia	23 Hydrogen (1 × 23)	= 23	541
	68 Carbon (6 × 68)	= 408	
	12 Oxygen (8 × 12)	= 96	
	1 Azote	= 14	
Azote			14
Barium			68
———, Chloride (crystallized)	1 Barium	= 68	122
	1 Chlorine	= 36	
	2 Water (9 × 2)	= 18	
Barytes	1 Barium	= 68	76
	1 Oxygen	= 8	
———, Carbonate	1 Barytes	= 76	98
	1 Carbonic Acid	= 22	
———, Nitrate	1 Barytes	= 76	130
	1 Nitric Acid	= 54	
———, Sulphate	1 Barytes	= 76	116
	1 Sulphuric Acid	= 40	
Bismuth			72
———, Oxide	1 Bismuth	= 72	80
	1 Oxygen	= 8	
———, Trisnitrate	3 Oxide of Bismuth (80 × 3)	= 240	294
	1 Nitric Acid	= 54	
Boron			20
Bromine			78
Cadmium			56
Calcium			20
———, Chloride (crystallized)	1 Calcium	= 20	110
	1 Chlorine	= 36	
	6 Water (9 × 6)	= 54	
———, Oxide (See Lime).			

Carbon			6
——, Oxide	1 Carbon	= 6	14
	1 Oxygen	= 8	
Cerium			48
Chlorine			36
Chromium			28
Cinchonia	12 Hydrogen (1 × 12)	= 12	154
	20 Carbon (6 × 20)	= 120	
	1 Oxygen	= 8	
	1 Azote	= 14	
Cobalt			30
Columbium			185
Conia	14 Hydrogen (1 × 14)	= 14	108
	12 Carbon (6 × 12)	= 72	
	1 Oxygen	= 8	
	1 Azote	= 14	
Copper			32
——, Acetate of, (crystallized)	1 Oxide of Copper	= 40	100
	1 Acetic Acid	= 51	
	1 Water	= 9	
——, Diacetate (crystallized)	2 Oxide of Copper (40 × 2)	= 80	185
	1 Acetic Acid	= 51	
	6 Water (9 × 6)	= 54	
——, Dioxide	2 Copper (32 × 2)	= 64	72
	1 Oxygen	= 8	
——, Protoxide	1 Copper	= 32	40
	1 Oxygen	= 8	
——, Sulphate (crystallized)	1 Protoxide Copper	= 40	125
	1 Sulphuric Acid	= 40	
	5 Water (9 × 5)	= 45	
Cyanogen	1 Azote	= 14	26
	2 Carbon (6 × 2)	= 12	
Ethereum or Ethule	5 Hydrogen (1 × 5)	= 5	29
	4 Carbon (6 × 4)	= 24	
Fluorine			18
Glucinium			18
Gold			200
Hydrogen			1
Iodine			126
Iridium			98
Iron			28
——, Bromide	1 Iron	= 28	106
	1 Bromine	= 78	
——, Iodide	1 Iron	= 28	199
	1 Iodine	= 126	
	5 Water (9 × 5)	= 45	
——, Percyanide (Prussian Blue)	7 Iron (28 × 7)	= 196	430
	9 Cyanogen (26 × 9)	= 234	
——, Potassio-tartrate	1 Tartrate of Potash	= 114	220
	1 Tartrate of Sesquioxide of Iron	= 106	
——, Protochloride	1 Iron	= 28	64
	1 Chlorine	= 36	

Iron, Protoxide	1 Iron	=	28	36
	1 Oxygen	=	8	
——, Sesquichloride	1 Iron	=	28	82
	1½ Chlorine	=	54	
——, Sesquioxide	1 Iron	=	28	40
	1½ Oxygen	=	12	
——, Sulphate (crystallized)	1 Protoxide of Iron	=	36	139
	1 Sulphuric Acid	=	40	
	7 Water	=	63	
Lantanium				
Lead				104
——, Acetate	1 Protoxide of Lead	=	112	190
	1 Acetic Acid	=	51	
	3 Water (9×3)	=	27	
——, Carbonate	1 Protoxide of Lead	=	112	134
	1 Carbonic Acid	=	22	
——, Chloride	1 Lead	=	104	140
	1 Chlorine	=	36	
——, Deutoxide	1 Lead	=	104	114·66
	1⅓ Oxygen (8+2·66)	=	10·66	
——, Diacetate	2 Protoxide of Lead	=	224	275
	1 Acetic Acid	=	51	
——, Dinoxide	1 Lead	=	104	120
	2 Oxygen (8×2)	=	16	
——, Iodide	1 Lead	=	104	230
	1 Iodine	=	126	
——, Protoxide	1 Lead	=	104	112
	1 Oxygen	=	8	
Lime	1 Calcium	=	20	28
	1 Oxygen	=	8	
——, Carbonate	1 Lime	=	28	50
	1 Carbonic Acid	=	22	
——, Chlorinated	2 Lime (28×2)	=	56	110
	1 Chlorine	=	36	
	2 Water (9×2)	=	18	
——, Citrate	1 Lime	=	28	95
	1 Citric Acid	=	58	
	1 Water	=	9	
——, Hydrate	1 Lime	=	28	37
	1 Water	=	9	
——, Phosphate	1 Lime	=	28	64
	1 Phosphoric Acid	=	36	
——, Subsesquiphosphate (Bone phosphate)	1½ Lime	=	42	78
	1 Phosphoric Acid	=	36	
——, Sulphate (crystallized)	1 Lime	=	28	86
	1 Sulphuric Acid	=	40	
	2 Water (9×2)	=	18	
——, Tartrate	1 Lime	=	28	130
	1 Tartaric Acid	=	66	
	4 Water (9×4)	=	36	
Lithium				8
Magnesium				12
Magnesia	1 Magnesium	=	12	20
	1 Oxygen	=	8	

Substance	Constituents		Equivalent	Total
Magnesia, Carbonate	1 Magnesia		20	42
	1 Carbonic Acid		22	
——, Carbonate (hydrated, P.L.)	5 Magnesia	(20 × 5)	100	242
	4 Carbonic Acid	(22 × 4)	88	
	6 Water	(9 × 6)	54	
——, Sulphate (crystallized)	1 Magnesia		20	123
	1 Sulphuric Acid		40	
	7 Water	(9 × 7)	63	
Manganese				28
——, Binoxide	1 Manganese		28	44
	2 Oxygen	(8 × 2)	16	
——, Chloride	1 Manganese		28	64
	1 Chlorine		36	
——, Oxide	1 Manganese		28	36
	1 Oxygen		8	
——, Sesquioxide	1 Manganese		28	40
	1½ Oxygen		12	
Mercury				202
——, Ammonio-chloride	1 Binoxide Mercury		218	526
	1 Bichloride Mercury		274	
	2 Ammonia	(17 × 2)	34	
——, Bichloride	1 Mercury		202	274
	2 Chlorine	(36 × 2)	72	
——, Bicyanide	1 Mercury		202	254
	2 Cyanogen	(26 × 2)	52	
——, Biniodide	1 Mercury		202	454
	2 Iodine	(126 × 2)	252	
——, Binoxide	1 Mercury		202	218
	2 Oxygen	(8 × 2)	16	
——, Bipersulphate	1 Binoxide Mercury		218	298
	2 Sulphuric Acid	(40 × 2)	80	
——, Bisulphuret	1 Mercury		202	234
	2 Sulphur	(16 × 2)	32	
——, Chloride	1 Mercury		202	238
	1 Chlorine		36	
——, Iodide	1 Mercury		202	328
	1 Iodine		126	
——, Nitrate	1 Oxide of Mercury		210	264
	1 Nitric Acid		54	
——, Oxide	1 Mercury		202	210
	1 Oxygen		8	
——, Pernitrate	1 Binoxide of Mercury		218	326
	2 Nitric Acid		108	
——, Sulphate	1 Oxide Mercury		210	250
	1 Sulphuric Acid		40	
——, Sulphuret	1 Mercury		202	218
	1 Sulphur		16	
Molybdenum				48
Morphia (anhydrous)	20 Hydrogen	(1 × 20)	20	292
	35 Carbon	(6 × 35)	210	
	6 Oxygen	(8 × 6)	48	
	1 Azote		14	
——, (crystallized)	1 Anhydrous Morphia		292	310
	2 Water	(9 × 2)	18	

Substance	Constituents		Equivalent
Morphia, Acetate (crystallized)	1 Morphia =	292	352
	1 Acetic Acid =	51	
	1 Water =	9	
———, Hydrochlorate	1 Morphia =	292	383
	1 Hydrochloric Acid =	37	
	6 Water (9×6) =	54	
Nickel			28
Osmium			100
Oxygen			8
Palladium			54
Platina			98
Phosphorus			16
Potash (anhydrous)	1 Potassium =	40	48
	1 Oxygen =	8	
———, Acetate	1 Potash =	48	99
	1 Acetic Acid =	51	
———, Arsenite	1 Potash =	48	98
	1 Arsenious Acid =	50	
———, Arseniate	1 Potash =	48	106
	1 Arsenic Acid =	58	
———, Bicarbonate (crystallized)	1 Potash =	48	101
	2 Carbonic Acid (22×2) =	44	
	1 Water =	9	
———, Binarseniate	1 Potash =	48	164
	2 Arsenic Acid =	116	
———, Bisulphate	1 Potash... =	48	146
	2 Sulphuric Acid (40×2) =	80	
	2 Water (9×2) =	18	
———, Bitartrate (crystallized)	1 Potash =	48	189
	2 Tartaric Acid (66×2) =	132	
	1 Water =	9	
———, Carbonate (anhydrous)	1 Potash =	48	70
	1 Carbonic Acid =	22	
———, Carbonate, P.L.	1 Potash =	48	83·5
	1 Carbonic Acid =	22	
	1½ Water =	13·5	
———, Citrate (anhydrous)	1 Potash =	48	106
	1 Citric Acid =	58	
———, Hydrate	1 Potash =	48	57
	1 Water =	9	
———, Nitrate	1 Potash =	48	102
	1 Nitric Acid =	54	
———, Sulphate	1 Potash =	48	88
	1 Sulphuric Acid =	40	
———, Sesquisulphate	1 Potash =	48	117
	1½ Sulphuric Acid =	60	
	1 Water =	9	
———, Tartrate	1 Potash =	48	114
	1 Tartaric Acid =	66	
Potassium			40
———, Bromide	1 Potassium =	40	118
	1 Bromine =	78	
———, Chloride	1 Potassium =	40	76
	1 Chlorine =	36	

Potassium, Ferrocyanide (crystallized)	1 Cyanide of Iron	= 54	213
	2 Cyanide of Potass. (66 × 2)	= 132	
	3 Water (9 × 3)	= 27	
————, Iodide	1 Potassium	= 40	166
	1 Iodine	= 126	
————, Sulphuret	1 Potassium	= 40	56
	1 Sulphur	= 16	
Quina	12 Hydrogen (1 × 12)	= 12	162
	20 Carbon (20 × 6)	= 120	
	2 Oxygen (8 × 2)	= 16	
	1 Azote	= 14	
——, Sulphate	1 Quina	= 162	274
	1 Sulphuric Acid	= 40	
	8 Water (9 × 8)	= 72	
——, Disulphate	2 Quina (162 × 2)	= 324	436
	1 Sulphuric Acid	= 40	
	8 Water (9 × 8)	= 72	
Rhodium			52
Selenium			40
Silicium			8
Silver			108
——, Chloride	1 Silver	= 108	144
	1 Chlorine	= 36	
——, Cyanide	1 Silver	= 108	134
	1 Cyanogen	= 26	
——, Nitrate	1 Oxide of Silver	= 116	170
	1 Nitric Acid	= 54	
Soda	1 Sodium	= 24	32
	1 Oxygen	= 8	
——, Acetate (crystallized)	1 Soda	= 32	137
	1 Acetic Acid	= 51	
	6 Water (9 × 6)	= 54	
——, Bicarbonate	1 Soda	= 32	85
	2 Carbonic Acid (22 × 2)	= 44	
	1 Water	= 9	
——, Borate, (anhydrous)	1 Soda	= 32	100
	1 Boracic Acid	= 68	
————, (crystallized)	1 Borate of Soda	= 100	190
	10 Water (9 × 10)	= 90	
——, Carbonate (anhydrous)	1 Soda	= 32	54
	1 Carbonic Acid	= 22	
————, (crystallized)	1 Soda	= 32	144
	1 Carbonic Acid	= 22	
	10 Water (9 × 10)	= 90	
——, Citrate (anhydrous)	1 Soda	= 32	90
	1 Citric Acid	= 58	
——, Hydrate	1 Soda	= 32	41
	1 Water	= 9	
——, Phosphate (crystallized)	1 Phosphate of Soda	= 68	180·5
	12·5 Water (9 × 12·5)	= 112·5	
——, Potassio-tartrate	1 Tartrate of Potash	= 114	284
	1 Tartrate of Soda	= 98	
	8 Water (9 × 8)	= 72	

Soda, Sesquicarbonate	1 Soda		= 32	83
	1½ Carbonic Acid		= 33	
	2 Water	(9×2)	= 18	
——, Sulphate (anhydrous)	1 Soda		= 32	72
	1 Sulphuric Acid		= 40	
——————— (crystallized)	1 Soda		= 32	162
	1 Sulphuric Acid		= 40	
	10 Water	(9×10)	= 90	
——, Tartrate (anhydrous)	1 Soda		= 32	98
	1 Tartaric Acid		= 66	
Sodium				24
———, Chloride	1 Sodium		= 24	60
	1 Chlorine		= 36	
———, Oxide. See Soda.				
Strontium				44
Strychnia	16 Hydrogen	(1×16)	= 16	234
	30 Carbon	(6×30)	= 180	
	3 Oxygen	(8×3)	= 24	
	1 Azote		= 14	
Sulphur				16
Tellurium				32
Thorinium				60
Tin				58
Titanium				24
Tungsten				100
Uranium				217
Vanadium				68
Veratria	22 Hydrogen	(1×22)	= 22	288
	34 Carbon	(6×34)	= 204	
	6 Oxygen	(8×6)	= 48	
	1 Azote		= 14	
Yttrium				32
Zinc				32
——, Chloride	1 Zinc		= 32	68
	1 Chlorine		= 36	
——, Oxide	1 Zinc		= 32	40
	1 Oxygen		= 8	
——, Sulphate (crystallized)	1 Oxide Zinc		= 40	143
	1 Sulphuric Acid		= 40	
	7 Water	(9×7)	= 63	
Zirconium				22

TABLE OF FORMER AND NEW NAMES.

A.

FORMER NAMES.	NEW NAMES.
Acidum Aceticum Dilutum.	Acetum Destillatum.
Acidum Aceticum Fortius.	Acidum Aceticum.
Acidum Muriaticum.	Acidum Hydrochloricum.
Æther Rectificatus.	Æther Sulphuricus.
Ammoniæ Murias.	Ammoniæ Hydrochloras.
Ammoniæ Subcarbonas.	Ammoniæ Sesquicarbonas.
Antimonii Sulphuretum.	Antimonii Sesquisulphuretum.
Antimonii Sulphuretum Præcipitatum.	Antimonii Oxysulphuretum.
Antimonium Tartarizatum.	Antimonii Potassio-tartras.
Aqua Pulegii.	Aqua Menthæ Pulegii.
Arsenicum Album.	Acidum Arseniosum.

B.

Bismuthi Subnitras.	Bismuthi Trisnitras.

C.

Calcis Murias.	Calcii Chloridum.
Ceratum Simplex.	Ceratum.
Confectio Amygdalarum.	Confectio Amygdalæ.
Confectio Aurantiorum.	Confectio Aurantii.
Confectio Scammoneæ.	Confectio Scammonii.
Cuprum Ammoniatum.	Cupri Ammonio-sulphas.

D.

Decoctum Cinchonæ.	Decoctum Cinchonæ Lancifoliæ.
Decoctum Lichenis.	Decoctum Cetrariæ.

FORMER NAMES.	NEW NAMES.
Decoctum Sarsaparillæ.	Decoctum Sarzæ.
Decoctum Sarsaparillæ Compositum.	Decoctum Sarzæ Compositum.
E.	
Emplastrum Galbani Compositum.	Emplastrum Galbani.
Emplastrum Picis Compositum.	Emplastrum Picis.
Extractum Cinchonæ.	Extractum Cinchonæ Lancifoliæ.
Extractum Humuli.	Extractum Lupuli.
Extractum Opii.	Extractum Opii Purificatum.
Extractum Sarsaparillæ.	Extractum Sarzæ.
F.	
Ferri Subcarbonas.	Ferri Sesquioxydum.
Ferrum Ammoniatum.	Ferri Ammonio-chloridum.
Ferrum Tartarizatum.	Ferri Potassio-tartras.
H.	
Hydrargyri Oxydum Cinereum.	Hydrargyri Oxydum.
Hydrargyri Oxydum Rubrum.	Hydrargyri Binoxydum.
Hydrargyri Oxymurias.	Hydrargyri Bichloridum.
Hydrargyri Submurias.	Hydrargyri Chloridum.
Hydrargyri Sulphuretum Nigrum.	Hydrargyri Sulphuretum cum Sulphure.
Hydrargyri Sulphuretum Rubrum.	Hydrargyri Bisulphuretum.
Hydrargyrum Præcipitatum Album.	Hydrargyri Ammonio-chloridum.
I.	
Infusum Caryophyllorum.	Infusum Caryophylli.
L.	
Linimentum Ammoniæ Fortius.	Linimentum Ammoniæ.
Linimentum Ammoniæ Subcarbonatis.	Linimentum Ammoniæ Sesquicarbonatis.
Linimentum Hydrargyri.	Linimentum Hydrargyri Compositum.

FORMER NAMES.	NEW NAMES.
Linimentum Saponis Compositum.	Linimentum Saponis.
Liquor Ammoniæ Subcarbonatis.	Liquor Ammoniæ Sesquicarbonatis.
Liquor Arsenicalis.	Liquor Potassæ Arsenitis.
Liquor Calcis Muriatis.	Liquor Calcii Chloridi.
Liquor Cupri Ammoniati.	Liquor Cupri Ammonio-sulphatis.
Liquor Hydrargyri Oxymuriatis.	Liquor Hydrargyri Bichloridi.
Liquor Plumbi Subacetatis.	Liquor Plumbi Diacetatis.
Liquor Plumbi Subacetatis Dilutus.	Liquor Plumbi Diacetatis Dilutus.
Liquor Potassæ Subcarbonatis.	Liquor Potassæ Carbonatis.
M.	
Magnesiæ Subcarbonas.	Magnesiæ Carbonas.
Mistura Amygdalarum.	Mistura Amygdalæ.
Mucilago Acaciæ.	Mistura Acaciæ.
Mucilago Amyli.	Decoctum Amyli.
O.	
Oleum Pulegii.	Oleum Menthæ Pulegii.
Oleum Terebinthinæ Rectificatum.	Oleum Terebinthinæ Purificatum.
Oxymel Simplex.	Oxymel.
P.	
Pilulæ Hydrargyri Submuriatis Compositæ.	Pilulæ Hydrargyri Chloridi Compositæ.
Pilulæ Saponis cum Opio.	Pilulæ Saponis Compositæ.
Plumbi Oxydum Semivitreum.	Plumbi Oxydum.
Plumbi Subcarbonas.	Plumbi Carbonas.
Potassa Fusa.	Potassæ Hydras.
Potassæ Carbonas.	Potassæ Bicarbonas.
Potassæ Subcarbonas.	Potassæ Carbonas.
Potassæ Sulphuretum.	Potassii Sulphuretum.
Potassæ Supersulphas.	Potassæ Bisulphas.
Potassæ Supertartras.	Potassæ Bitartras.

FORMER NAMES.	NEW NAMES.
Pulvis Antimonialis.	Pulvis Antimonii Compositus.
Pulvis Scammoneæ Compositus.	Pulvis Scammonii Compositus.
S.	
Sodæ Carbonas.	Sodæ Sesquicarbonas.
Sodæ Murias.	Sodii Chloridum.
Sodæ Subboras.	Sodæ Biboras.
Sodæ Subcarbonas.	Sodæ Carbonas.
Sodæ Subcarbonas Exsiccata.	Sodæ Carbonas Exsiccata.
Soda Impura.	Sodæ Carbonas Impura.
Soda Tartarizata.	Sodæ Potassio-tartras.
Spiritus Ammoniæ Succinnatus.	Tinctura Ammoniæ Composita.
Spiritus Camphoræ.	Tinctura Camphoræ.
Spiritus Colchici Ammoniatus.	Tinctura Colchici Ammoniata.
Spiritus Lavandulæ Compositus.	Tinctura Lavandulæ Composita.
Spiritus Pulegii.	Spiritus Menthæ Pulegii.
Syrupus Aurantiorum.	Syrupus Aurantii.
Syrupus Sarsaparillæ.	Syrupus Sarzæ.
Syrupus Simplex.	Syrupus.
T.	
Tinctura Cinchonæ [Lancifoliæ].	Tinctura Cinchonæ [Cordifoliæ].
Tinctura Ferri Ammoniati.	Tinctura Ferri Ammonio-chloridi.
Tinctura Ferri Muriatis.	Tinctura Ferri Sesquichloridi.
Tinctura Guaiaci Ammoniata.	Tinctura Guaiaci Composita.
Tinctura Hellebori Nigri.	Tinctura Hellebori.
Tinctura Humuli.	Tinctura Lupuli.
Tinctura Sennæ.	Tinctura Sennæ Composita.
Tinctura Valerianæ Ammoniata.	Tinctura Valerianæ Composita.
V.	
Vinum Antimonii Tartarizati.	Vinum Antimonii Potassio-tartratis.
U.	
Unguentum Elemi Compositum.	Unguentum Elemi.
Unguentum Hydrargyri Præcipitati Albi.	Unguentum Hydrargyri Ammonio-chloridi.

TABLE OF NEW AND FORMER NAMES.

A.

NEW NAMES.	FORMER NAMES.
Acetum Destillatum.	Acidum Aceticum Dilutum.
Acidum Aceticum.	Acidum Aceticum Fortius.
Acidum Arseniosum.	Arsenicum Album.
Acidum Hydrochloricum.	Acidum Muriaticum.
Æther Sulphuricus.	Æther Rectificatus.
Ammoniæ Hydrochloras.	Ammoniæ Murias.
Ammoniæ Sesquicarbonas.	Ammoniæ Subcarbonas.
Antimonii Oxysulphuretum.	Antimonii Sulphuretum Præcipitatum.
Antimonii Potassio-tartras.	Antimonium Tartarizatum.
Antimonii Sesquisulphuretum.	Antimonii Sulphuretum.
Aqua Menthæ Pulegii.	Aqua Pulegii.

B.

Bismuthi Trisnitras.	Bismuthi Subnitras.

C.

Calcii Chloridum.	Calcis Murias.
Ceratum.	Ceratum Simplex.
Confectio Amygdalæ.	Confectio Amygdalarum.
Confectio Aurantii.	Confectio Aurantiorum.
Confectio Scammonii.	Confectio Scammoneæ.
Cupri Ammonio-sulphas.	Cuprum Ammoniatum.

D.

Decoctum Amyli.	Mucilago Amyli.
Decoctum Cetrariæ.	Decoctum Lichenis.

NEW NAMES.	FORMER NAMES.
Decoctum Cinchonæ Lancifoliæ.	Decoctum Cinchonæ.
Decoctum Sarzæ.	Decoctum Sarsaparillæ.
Decoctum Sarzæ Compositum.	Decoctum Sarsaparillæ Compositum.
E.	
Emplastrum Galbani.	Emplastrum Galbani Compositum.
Emplastrum Picis.	Emplastrum Picis Compositum.
Extractum Cinchonæ Lancifoliæ.	Extractum Cinchonæ.
Extractum Lupuli.	Extractum Humuli.
Extractum Opii Purificatum.	Extractum Opii.
Extractum Sarzæ.	Extractum Sarsaparillæ.
F.	
Ferri Ammonio-chloridum.	Ferrum Ammoniatum.
Ferri Potassio-tartras.	Ferrum Tartarizatum.
Ferri Sesquioxydum.	Ferri Subcarbonas.
H.	
Hydrargyri Ammonio-chloridum.	Hydrargyrum Præcipitatum Album.
Hydrargyri Bichloridum.	Hydrargyri Oxymurias.
Hydrargyri Binoxydum.	Hydrargyri Oxydum Rubrum.
Hydrargyri Bisulphuretum.	Hydrargyri Sulphuretum Rubrum.
Hydrargyri Chloridum.	Hydrargyri Submurias.
Hydrargyri Oxydum.	Hydrargyri Oxydum Cinereum.
Hydrargyri Sulphuretum cum Sulphure.	Hydrargyri Sulphuretum Nigrum.
I.	
Infusum Caryophylli.	Infusum Caryophyllorum.

L.

NEW NAMES.	FORMER NAMES.
Linimentum Ammoniæ.	Linimentum Ammoniæ Fortius.
Linimentum Ammoniæ Sesquicarbonatis.	Linimentum Ammoniæ Subcarbonatis.
Linimentum Hydrargyri Compositum.	Linimentum Hydrargyri.
Linimentum Saponis.	Linimentum Saponis Compositum.
Liquor Ammoniæ Sesquicarbonatis.	Liquor Ammoniæ Subcarbonatis.
Liquor Calcii Chloridi.	Liquor Calcis Muriatis.
Liquor Cupri Ammonio-sulphatis.	Liquor Cupri Ammoniati.
Liquor Hydrargyri Bichloridi.	Liquor Hydrargyri Oxymuriatis.
Liquor Plumbi Diacetatis.	Liquor Plumbi Subacetatis.
Liquor Plumbi Diacetatis Dilutus.	Liquor Plumbi Subacetatis Dilutus.
Liquor Potassæ Arsenitis.	Liquor Arsenicalis.
Liquor Potassæ Carbonatis.	Liquor Potassæ Subcarbonatis.

M.

Magnesiæ Carbonas.	Magnesiæ Subcarbonas.
Mistura Acaciæ.	Mucilago Acaciæ.
Mistura Amygdalæ.	Mistura Amygdalarum.

O.

Oleum Menthæ Pulegii.	Oleum Pulegii.
Oleum Terebinthinæ Purificatum.	Oleum Terebinthinæ Rectificatum.
Oxymel.	Oxymel Simplex.

P.

Pilulæ Hydrargyri Chloridi Compositæ.	Pilulæ Hydrargyri Submuriatis Compositæ.

NEW NAMES.	FORMER NAMES.
Pilulæ Saponis Compositæ.	Pilulæ Saponis cum Opio.
Plumbi Carbonas.	Plumbi Subcarbonas.
Plumbi Oxydum.	Plumbi Oxydum Semivitreum.
Potassæ Bicarbonas.	Potassæ Carbonas.
Potassæ Bisulphas.	Potassæ Supersulphas.
Potassæ Bitartras.	Potassæ Supertartras.
Potassæ Carbonas.	Potassæ Subcarbonas.
Potassæ Hydras.	Potassa Fusa.
Potassii Sulphuretum.	Potassæ Sulphuretum.
Pulvis Antimonii Compositus.	Pulvis Antimonialis.
Pulvis Scammonii Compositus.	Pulvis Scammoneæ Compositus.
S.	
Sodæ Biboras.	Sodæ Subboras.
Sodæ Carbonas.	Sodæ Subcarbonas.
Sodæ Carbonas Exsiccata.	Sodæ Subcarbonas Exsiccata.
Sodæ Carbonas Impura.	Soda Impura.
Sodæ Potassio-tartras.	Soda Tartarizata.
Sodæ Sesquicarbonas.	Sodæ Carbonas.
Sodii Chloridum.	Sodæ Murias.
Spiritus Menthæ Pulegii.	Spiritus Pulegii.
Syrupus.	Syrupus Simplex.
Syrupus Aurantii.	Syrupus Aurantiorum.
Syrupus Sarzæ.	Syrupus Sarsaparillæ.
T.	
Tinctura Ammoniæ Composita.	Spiritus Ammoniæ Succinatus.
Tinctura Camphoræ.	Spiritus Camphoræ.
Tinctura Cinchonæ [Cordifoliæ].	Tinctura Cinchonæ [Lancifoliæ].
Tinctura Colchici Composita.	Spiritus Colchici Ammoniatus.
Tinctura Ferri Ammonio-chloridi.	Tinctura Ferri Ammoniati.
Tinctura Ferri Sesquichloridi.	Tinctura Ferri Muriatis.
Tinctura Guaiaci Composita.	Tinctura Guaiaci Ammoniata.
Tinctura Hellebori.	Tinctura Hellebori Nigri.
Tinctura Lavandulæ Composita.	Spiritus Lavandulæ Compositus.

NEW NAMES.	FORMER NAMES.
Tinctura Lupuli.	Tinctura Humuli.
Tinctura Sennæ Composita.	Tinctura Sennæ.
Tinctura Valerianæ Composita.	Tinctura Valerianæ Ammoniata.
V.	
Vinum Antimonii Potassio-tartratis.	Vinum Antimonii Tartarizati.
U.	
Unguentum Elemi.	Unguentum Elemi Compositum.
Unguentum Hydrargyri Ammonio-chloridi.	Unguentum Hydrargyri Præcipitati Albi.

TABLE,

Regulating the ordinary proportion of Doses, according to the Age of the Patient.

For an Adult	1	e. g. ʒj.
From 21 Years to 14	$\frac{2}{3}$	℈ij.
14 —— 7	$\frac{1}{2}$	ʒss.
7 —— 4	$\frac{1}{3}$	℈j.
4	$\frac{1}{4}$	gr. xv.
3	$\frac{1}{6}$	gr. x.
2	$\frac{1}{8}$	gr. viii.
1	$\frac{1}{12}$	gr. v.

POSOLOGICAL TABLE.

Absinthium	℈j	to	ʒj.
Acacia	ʒss		ʒij.
Acetum Colchici	fʒss		fʒj.
——— Destillatum	fʒi		f℥ss.
——— Scillæ	fʒss		fʒij.
Acidum Benzoicum	gr. x		ʒss.
——— Citricum	gr. x		ʒss.
——— Hydrochloricum	♏v		♏xx.
——— Hydrochloricum Dilutum	♏xx		fʒi.
——— Nitricum Dilutum	♏x		♏xl.
——— Hydrocyanicum Dilutum	♏v.		
——— Phosphoricum Dilutum	♏xx		fʒj.
——— Sulphuricum Dilutum	♏x		♏xl.
——— Tartaricum	gr. x		ʒss.
Aconiti Folia	gr. j		gr. v.
Æther Sulphuricus	fʒss		fʒij.
Ærugo	gr. $\frac{1}{8}$		gr. j.
Alöes Extractum	gr. v		gr. xv.
Alumen	gr. x		℈j.
Ammoniacum	gr. x		ʒss.
Ammoniæ Hydrochloras	gr. x		ʒss.
——— Sesquicarbonas	gr. v		℈j.
Anethi Fructus	gr. x		ʒj.
Anisi Fructus	gr. x		ʒj.
Anthemidis Flores	gr. x		ʒss.
Antimonii Oxysulphuretum	gr. j		gr. iv.
——— Potassio-tartras (Diaphoretic)	gr. $\frac{1}{4}$		gr. ss.
——————— (Emetic)	gr. j		gr. ij.
——— Sesquisulphuretum	gr. x		ʒss.

Aqua Anethi	f℥j to	f℥iv.
—— Carui		
—— Cinnamomi		
—— Fœniculi		
—— Menthæ Piperitæ		
———— Pulegii		
———— Viridis		
—— Pimentæ		
Argenti Nitras	gr. $\frac{1}{8}$	gr. j.
Armoraciæ Radix	℈j	ʒj.
Assafœtida	gr. x	ʒss.
Balsamum Peruvianum	gr. x	ʒss.
———— Tolutanum	gr. x	ʒss.
Belladonnæ Folia	gr. ss	gr. x.
Benzoinum	gr. x	ʒss.
Bismuthi Trisnitras	gr. v	gr. xv.
Cajuputi Oleum	♏j	♏v.
Calumbæ Radix	gr. x	℈j.
Cambogia	gr. ij	gr. x.
Camphora	gr. iij	℈j.
Canellæ Cortex	gr. x	ʒss.
Capsici Baccæ	gr. v	gr. x.
Cardamines Flores	℈j	ʒj.
Cardamomi Semina	gr. v	ʒss.
Carui Fructus	gr. x	ʒj.
Caryophylli	gr. v	ʒss.
———— Oleum	♏j	♏v.
Cascarillæ Cortex	gr. x	ʒj.
Cassiæ Pulpa	℥ss	℥j.
Castoreum	gr. v	℈j.
Catechu	gr. x	℈ij.
Centaurii Cacumina	gr. xv	ʒj.
Cetaceum	℈j	ʒiss.
Cinchonæ Cordifoliæ Cortex	gr. x	ʒiss.
———— Lancifoliæ Cortex	gr. x	ʒiss.
———— Oblongifoliæ Cortex	gr. x	ʒiss.
Cinnamomi Cortex	gr. v	℈j.

Cinnamoni Oleum	♏j	to	♏iij.
Colchici Cormus	gr. j		gr. v.
Colocynthidis Pulpa	gr. j		gr. v.
Confectio Aromatica	℈j		ʒj.
——— Aurantii	ʒj		℥j.
——— Cassiæ	ʒij		℥j.
——— Opii	gr. x		ʒss.
——— Piperis Nigri	ʒj		ʒij.
——— Rosæ Caninæ	ʒj		℥j.
————— Gallicæ	ʒj		℥j.
——— Scammonii	ʒss		ʒj.
——— Sennæ	ʒj		ʒiij.
Conii Folia	gr. v		℈j.
Contrajervæ Radix	gr. x		ʒss.
Copaiba	℈j		ʒj.
Coriandri Fructus	℈j		ʒj.
Creta Præparata	gr. x		℈ij.
Cubeba	ʒj		ʒij.
Cupri Ammonio-sulphas	gr. $\frac{1}{4}$		gr. v.
Cupri Sulphas	gr. ss		gr. ij.
———— (Emetic)	gr. ij		gr. x.
Cuspariæ Cortex	gr. x		ʒj.
Cymini Fructus	℈j		ʒj.
Dauci Fructus	℈j		ʒj.
Decoctum Aloës Compositum	f℥ss		f℥j.
——— Cetrariæ	f℥i		f℥iv.
——— Chimaphilæ	f℥j		f℥jss.
——— Cinchonæ	f℥j		f℥iij.
——— Dulcamaræ	f℥ss		f℥j.
——— Granati	f℥ss		f℥j.
——— Sarzæ	f℥iv		f℥viii.
————— Compositum	f℥iv		f℥vi.
——— Scoparii Compositum	f℥i		f℥iss.
——— Senegæ	f℥iss		f℥iij.
——— Tormentillæ	f℥i		f℥iss.
——— Ulmi	f℥iv		f℥vj.
——— Uvæ Ursi	f℥j		f℥ij.
Digitalis Folia	gr. ss		gr. iij.

Extractum Aconiti	gr. ss to	gr. v.
——— Aloës purificatum	gr. v	gr. xv.
——— Cinchonæ	gr. x	ʒss.
——— Colchici Aceticum	gr. ss	gr. ij.
—————— Cormi	gr. ss	gr. ij.
——— Colocynthidis	gr. v	℈j.
—————————— Compositum	gr. v	ʒss.
——— Conii	gr. v	℈j.
——— Digitalis	gr. ss	gr. j.
——— Elaterii	gr. ss	gr. ij.
——— Gentianæ	gr. x	ʒss.
——— Hæmatoxyli	gr. x	ʒss.
——— Hyoscyami	gr. v	gr. x.
——— Jalapæ	gr. x	℈j.
——— Lactucæ	gr. v	gr. x.
——— Lupuli	gr. v	℈j.
——— Opii purificatum	gr. j	gr. v.
——— Papaveris	gr. ij	℈j.
——— Pareiræ	gr. x	ʒss.
——— Rhei	gr. x	ʒss
——— Sarzæ	℈j	ʒj.
——— Stramonii	gr. $\frac{3}{4}$	gr. ij.
——— Taraxaci	gr. x	ʒj.
——— Uvæ Ursi	gr. x	℈j.
Ferri Ammonio-chloridum	gr. iij	gr. xv.
—— Iodidum	gr. i	gr. ij.
—— Potassio-tartras	gr. x	ʒss.
—— Sesquioxydum	gr. v	ʒiv.
—— Sulphas	gr. j	gr. v.
Fœniculi Fructus	℈j	ʒj.
Galbani Gummi-resina	gr. x	ʒss.
Gentianæ Radix	gr. x	ʒj.
Granati Cortex	℈j	ʒj.
Guaiaci Resina	gr. x	ʒss.
Hydrargyri Bichloridum	gr. $\frac{1}{8}$	gr. $\frac{1}{4}$.
Hydrargyri Biniodidum	gr. ss	gr. j.

Hydrargyri Binoxydum	gr. ss to	gr. j.
——— Chloridum (Alterative)	gr. ss	gr. j.
——— (Purgative)	gr. v	gr. x.
——— Iodidum	gr. j	gr. iij.
——— Oxydum	gr. j	gr. iij.
——— Sulphuretum cum Sulphure	gr. v	ʒss.
Hydrargyrum cum Cretâ	gr. x	ʒss.
Hyoscyami Folia	gr. v	gr. x.
Jalapæ Radix	gr. x	ʒss.
Infusum Anthemidis	f℥j	f℥ij.
——— Armoraciæ Compositum	f℥j	f℥iss.
——— Aurantii Compositum	f℥j	f℥ij.
——— Calumbæ	f℥iss	f℥ij.
——— Caryophylli	f℥j	f℥ij.
——— Cascarillæ	f℥iss	f℥ij.
——— Catechu Compositum	f℥j	f℥iij.
——— Cinchonæ	f℥j	f℥iij.
——— Cuspariæ	f℥iss	f℥ij.
——— Digitalis	f℥ss	f℥j.
——— Diosmæ	f℥iss	f℥ij.
——— Gentianæ Compositum	f℥iss	f℥ij.
——— Krameriæ	f℥iss	f℥ij.
——— Lupuli	f℥i	f℥iss.
——— Pareiræ	f℥i	f℥iss.
——— Quassiæ	f℥iss	f℥ij.
——— Rhei	f℥j	f℥iij.
——— Rosæ Compositum	f℥j	f℥iss.
——— Scoparii	f℥j	f℥ij.
——— Sennæ Compositum	f℥ij	f℥iv.
——— Serpentariæ	f℥i	f℥ij.
——— Simarubæ	f℥j	f℥ij.
——— Valerianæ	f℥iss	f℥ij.
Ipecacuanha (Diaphoretic)	gr. ss	gr. ij.
——— (Emetic)	gr. v	ʒss.
Kino	gr. x	ʒss.
Krameria	gr. x	℈j.

Lavandulæ Flores	℈j to	ʒj.
Lauri Baccæ et Folia	gr. x	ʒss.
Liquor Ammoniæ	♏x	fʒss.
——— Acetatis	fʒiv	fʒvi.
——— Sesquicarbonatis	fʒss	fʒj.
——— Calcis	f℥j	f℥vj.
——— Calcii Chloridi	♏xl	fʒij.
——— Hydrargyri Bichloridi	fʒss	fʒij.
——— Potassæ	♏x	fʒss.
——— Arsenitis	♏iv	♏xv.
——— Carbonatis	♏x	fʒj.
——— Potassii Iodidi Compositus	fʒss	f℥ss.
Magnesia	ʒss	ʒj.
Magnesiæ Carbonas	℈j	ʒj.
——— Sulphas	℥ss	℥iss.
Malva	℈j	ʒj.
Manna	℥ss	℥ij.
Mastiche	gr. x	ʒss.
Marrubium	℈j	ʒj.
Mentha Piperita	gr. x	ʒj.
——— Viridis	gr. x	ʒj.
Menyanthes	ʒss	ʒj.
Mezerei Cortex	gr. j	gr. x.
Mistura Acaciæ	fʒj	f℥j.
——— Ammoniaci	f℥ss	f℥j.
——— Assafœtidæ	f℥ss	f℥j.
——— Camphoræ	f℥j	f℥ij.
——— Cascarillæ Composita	f℥j	f℥iss.
——— Cretæ	f℥j	f℥ij.
——— Ferri Composita	f℥j	f℥ij.
——— Gentianæ Composita	f℥i	f℥ij.
——— Guaiaci	f℥ss	f℥ij.
——— Moschi	f℥j	f℥ij.
——— Spiritûs Vini Gallici	f℥ss	f℥iss.
Morphiæ Acetas	gr. $\frac{1}{8}$	gr. $\frac{1}{4}$.
——— Hydrochloras	gr. $\frac{1}{8}$	gr. $\frac{1}{4}$.
Moschus	gr. ij	℈j.
Myristicæ Nuclei	gr. v	gr. x.

Myrrha	gr. x to	ʒj.
Oleum Anisi	♏j	♏v.
—— Anthemidis	♏j	♏v.
—— Carui	♏j	♏v.
—— Caryophylli	♏j	♏v.
—— Cinnamomi	♏j	♏iij.
—— Juniperi	♏j	♏v.
—— Lavandulæ	♏j	♏v.
—— Menthæ Piperitæ	♏j	♏iij.
———— Viridis	♏j	♏v.
———— Pulegii	♏j	♏v.
—— Origani	♏j	♏iij.
—— Pimentæ	♏j	♏iij.
—— Ricini	fʒiv	f℥iss.
—— Rosmarini	♏ij	♏v.
—— Succini	♏v	♏x.
—— Terebinthinæ Purificatum (Diuretic)	♏x	fʒss.
———————— (Vermifuge)	fʒij	f℥j.
Olibanum	gr. x	ʒss.
Opium	gr. ss	gr. v.
Opoponax	gr. x	ʒss.
Oxymel	fʒj	f℥ss.
—— Scillæ	fʒss	fʒij.
Pilulæ Aloës Compositæ	gr. x	℈j.
———— cum Myrrhâ	gr. x	℈j.
—— Cambogiæ Compositæ	gr. x	℈j.
—— Conii Compositæ	gr. iij	gr. v.
—— Ferri Compositæ	gr. x	℈j.
—— Galbani Compositæ	gr. x	℈j.
—— Hydrargyri (Alterative)	gr. iv	gr. vi.
———— (Purgative)	gr. x	℈j.
———— Chloridi Compositæ	gr. v	gr. x.
—— Ipecacuanhæ Compositæ	gr. v	gr. x.
—— Rhei Compositæ	gr. x	℈j.
—— Saponis Compositæ	gr. iij	gr. x.
—— Sagapeni Compositæ	gr. v	gr. x.
—— Scillæ Compositæ	gr. x	℈j.

Pilulæ Styracis Compositæ	gr. iij	to	gr. x.
Pimentæ Baccæ	gr. v		℈j.
Piperis Longi Fructus	gr. v		℈j.
—— Nigri Baccæ	gr. v		℈j.
Plumbi Acetas	gr. ss		gr. j.
Plumbi Iodidi	gr. $\frac{1}{4}$		gr. $\frac{1}{2}$.
Potassæ Acetas	℈j		ʒj.
—— Bicarbonas	gr. x		ʒss.
—— Bisulphas	gr. x		ʒj.
—— Bitartras	ʒj		℥ss.
—— Carbonas	gr. x		ʒss.
—— Nitras	gr. x		ʒss.
—— Sulphas	gr. x		℥ss.
—— Tartras	ʒj		℥j.
Potassii Bromidum	gr. iij		gr. x.
Potassii Iodidum	gr. v		gr. x.
Pulvis Aloës Compositus	gr. x		℈j.
—— Antimonii Compositus	gr. v		gr. x.
—— Cinnamomi Compositus	gr. v		gr. x.
—— Cretæ Compositus	gr. v		ʒss.
—— Cretæ Compositus cum Opio	gr. v		ʒss.
—— Jalapæ Compositus	℈j		℈ij.
—— Ipecacuanhæ Compositus	gr. v		℈j.
—— Kino Compositus	gr. v		℈j.
—— Scammonii Compositus	gr. v		℈j.
—— Tragacanthæ Compositus	gr. x		ʒj.
Quassiæ Lignum	gr. v		ʒss.
Quercus Cortex	gr. x		ʒss.
Quinæ Disulphas	gr. iij		gr. x.
Rhamni Baccæ	ʒj		ʒij.
Rhei Radix	gr. x		ʒss.
Rosæ Caninæ Pulpa	ʒj		℥j.
Rosæ Centifoliæ Petala	℈j		ʒj.
—— Gallicæ Petala	℈j		ʒj.
Rosmarini Cacumina	gr. x		ʒss.
Rutæ Folia	gr. xv		℈ij.

Sabinæ Folia	gr. x to	ʒss.
Sagapenum	gr. x	ʒss.
Sapo Durus	gr. v	ʒss.
Sarzæ Radix	℈j	ʒj.
Sassafras Lignum	℈j	ʒj.
Scammonium	gr. v	℈j.
Scillæ Radix Recens	gr. v	gr. xv.
———— Exsiccata	gr. j	gr. iij.
Senegæ Radix	℈j	℈ij.
Sennæ Folia	℈j	ʒj.
Serpentariæ Radix	gr. x	ʒss.
Simarubæ Cortex	gr. x	ʒss.
Sinapis Semina	ʒj	℥ss.
Sodæ Biboras	gr. x	ʒss.
—— Carbonas	gr. x	ʒss.
———— Exsiccata	gr. v	gr. xv.
—— Potassio-tartras	ʒij	℥j.
—— Sesquicarbonas	gr. x	ʒss.
—— Sulphas	℥ss	℥ij.
Spigeliæ Radix	gr. x	℈ij.
Spiritus Ætheris Nitrici	♏x	♏xl.
———— Sulphurici Compositus	fʒss	fʒij.
—— Ammoniæ Aromaticus	fʒss	fʒj.
———— Fœtidus	♏xv	fʒss.
—— Anisi	fʒij	f℥ss.
—— Armoraciæ Compositus	fʒij	f℥ss.
—— Carui	fʒij	f℥ss.
—— Cinnamomi	fʒij	f℥ss.
—— Juniperi Compositus	fʒiij	f℥j.
—— Menthæ Piperitæ	fʒij	f℥ss.
———— Pulegii	fʒij	f℥ss.
———— Viridis	fʒij	f℥ss.
—— Myristicæ	fʒij	f℥ss.
—— Pimentæ	fʒij	f℥ss.
Stannum	ʒi	℥ss.
Strychnia	gr. $\frac{1}{16}$	gr. $\frac{1}{8}$.
Sulphur	ʒj	ʒij.
Syrupus Papaveris	fʒj	f℥j.
—— Rhamni	f℥ss	f℥j.

Syrupus Sarzæ	fʒj to	f℥ss.
——— Sennæ	fʒij	fʒiv.
Tabaci Folia	gr. ss	gr. v.
Tamarindi Pulpa	℥ss	℥j.
Terebinthina Canadensis	℈j	ʒj.
——— Chia	℈j	ʒj.
——— Vulgaris	℈j	ʒj.
Tiglii Oleum	♏j	♏ij.
Tinctura Aloës	f℥ss	f℥iss.
——— Composita	fʒj	fʒij.
——— Ammoniæ Composita	♏v	♏x.
——— Assafœtidæ	fʒss	fʒiss.
——— Aurantii	fʒij	fʒiij.
——— Balsami Tolutani	fʒj	fʒij.
——— Benzoini Composita	fʒss	fʒij.
——— Calumbæ	fʒj	fʒiij.
——— Camphoræ Composita	fʒj	fʒiij.
——— Cantharidis	♏x	fʒj.
——— Capsici	♏x	fʒj.
——— Cardamomi	fʒj	fʒij.
——— ——— Composita	fʒj	fʒij.
——— Cascarillæ	fʒj	fʒij.
——— Castorei	♏xx	fʒij.
——— Catechu	fʒj	fʒiij.
——— Cinchonæ	fʒj	fʒiij.
——— ——— Composita	fʒj	fʒiij.
——— Cinnamomi	fʒj	fʒij.
——— ——— Composita	fʒj	fʒij.
——— Colchici	♏x	fʒss.
——— ——— Composita	fʒss	fʒj.
——— Conii	fʒss	fʒj.
——— Cubebæ	fʒss	fʒj.
——— Digitalis	♏x	♏xl.
——— Ferri Ammonio-chloridi	fʒss	fʒij.
——— ——— Sesquichloridi	♏x	fʒj.
——— Gallæ	fʒj	fʒij.
——— Gentianæ Composita	fʒj	fʒij.
——— Guaiaci	fʒj	fʒiij.

Tinctura Guaiaci Composita	fʒss	to	fʒj.
——— Hellebori	fʒss		fʒj.
——— Hyoscyami	fʒss		fʒij.
——— Iodinii Composita	♏x		fʒj.
——— Jalapæ	fʒj		f℥ss.
——— Kino	fʒj		fʒij.
——— Lavandulæ Composita	fʒss		fʒij.
——— Lupuli	fʒss		fʒij.
——— Myrrhæ	fʒss		fʒj.
——— Opii	♏x		fʒj.
——— Rhei Composita	fʒij		f℥iss.
——— Scillæ	♏x		fʒss.
——— Sennæ Composita	fʒij		f℥j.
——— Serpentariæ	fʒj		fʒiij.
——— Valerianæ	fʒj		fʒiij.
——————— Composita	fʒss		fʒj.
——— Zingiberis	fʒj		fʒij.
Tormentillæ Radix	gr. x		ʒss.
Tragacantha	gr. x		ʒj.
Valerianæ Radix	℈j		ʒij.
Veratria	gr. $\frac{1}{8}$		gr. $\frac{1}{4}$.
Veratri Radix	gr. ij		gr. v.
Vinum Aloës	f℥j		f℥ij.
——— Antimonii Potassio-tartratis	♏xv		fʒj.
——— Colchici	fʒss		fʒj.
——— Ipecacuanhæ (Diaphoretic)	♏xx		♏xl.
——————— (Emetic)	fʒij		f℥ss.
——— Opii	♏x		fʒj.
——— Veratri	♏v		♏x.
Uva Ursi	gr. x		ʒj.
Zinci Oxydum	gr. j		gr. vj.
—— Sulphas	gr. j		gr. v.
————— (Emetic)	gr. x		ʒss.

APPENDIX.

HYPOTHETICAL OPINIONS AS TO THE NATURE OF AMMONIACAL SALTS.

In mentioning (p. 66) the salt formerly called sal ammoniac, afterwards muriate of ammonia, and more recently hydrochlorate of ammonia, I considered it, as the last-mentioned name imports, as a compound of hydrochloric acid and ammonia, in which neither the acid nor the alkali undergoes decomposition. It has, however, been supposed by Berzelius, when these substances act upon each other, that hydrogen is transferred from the hydrochloric acid to the ammonia, and consequently that the salt, which considered as hydrochlorate of ammonia would be written NH^3, HCl, becomes NH^4, Cl; in which NH^4 represents *ammonium*, an hypothetical compound, possessing to a certain extent the properties of a metal, and this combining with the chlorine deprived of hydrogen, becomes *chloride of ammonium.*

When, on the contrary, an oxacid, as sulphuric acid, is added to a solution of ammonia, this hypothesis supposes that an equivalent of water suffers decomposition; so that the salt usually called sulphate of ammonia, NH^3, SO^3, HO, becomes *sulphate of oxide of ammonium*, or NH^4 O, SO^3: in this case the ammonia becomes ammonium by combining with the hydrogen of the decomposed water, and this is simultaneously converted into oxide by uniting with its oxygen; and being thus analogous to a metal combined with oxygen, it has acquired the condition requisite to its combination with an acid, and consequently unites like a metallic oxide with the sulphuric acid, as above-mentioned, forming the sulphate of oxide of ammonium.

Professor Graham appears to adopt the above-described hypothesis, regarding sal ammoniac as chloride of ammonium, and sulphate of ammonia as sulphate of oxide of ammonium; but in the case of the sulphates of metallic oxides, he seems to favour

the opinion, that the oxygen of the base is transferred to the acid; so that while the oxide is reduced to the metallic state, the sulphuric acid becomes, by the addition of the oxygen, a compound represented by SO^4, for which Professor Graham proposes the name of *sulphatoxygen*, and that of *sulphatoxide*, to express a compound of it and a metal; so that on the "old view" that which was called *sulphate of soda*, is on the "new view" *sulphatoxide of sodium*, or Na, SO^4, instead of, as formerly, NaO, SO^3.

Professor Daniell, grounding his opinion on the results of electrical decompositions, has also offered an explanation of the constitution of some ammoniacal and other salts. With respect to sal ammoniac, he admits the views of Berzelius, that it is a chloride of ammonium; or, adopting his words, this salt is an "electrolyte whose simple anion is chlorine, and compound cathion nitrogen with 4 equivalents of hydrogen." With respect to the salt obtained by the action of hydrated sulphuric acid upon ammonia, he considers it, as Professor Graham does a sulphate of a metallic oxide, as a compound, in which all the oxygen is combined with the sulphur, forming a substance whose symbol is SO^4, combined with ammonium NH^4; and this salt, usually termed hydrated sulphate of ammonia, Professor Daniell describes as an *oxysulphion of ammonium*, and the sulphates of metallic oxides he regards as oxysulphions of their respective metals.

Dr. Kane, on the other hand, considers that ammonia, instead of acquiring an equivalent of hydrogen to become *ammonium*, loses one to form *amidogene*, represented by NH^2; and he regards sal ammoniac neither as hydrochlorate of ammonia nor chloride of ammonium, but as a *chloro-amidide of hydrogen*: NH^2, H (=ammonia) represents *amidide of hydrogen*, and this combined with *chloride of hydrogen*, HCl (=hydrochloric acid) yields NH^2, H, HCl, *chloramidide of hydrogen* (= NH^3, HCl, hydrochlorate of ammonia). The nature of the salts formed by the action of oxacids upon ammonia, corresponding to this view of the action of hydracids, is this: taking sulphuric acid as an example, when this acid acts upon ammonia, there results neither sulphate of ammonia nor sulphate of oxide of ammonium, but *sulphate of amidide of hydrogen*, NH^2, H, SO^3. This may be

considered as a type of the compounds resulting from the action of oxacids upon ammonia on Dr. Kane's hypothesis.

It has been supposed that the hypotheses above described offer more simple and philosophical explanations of the action of acids on metals and of the nature of the resulting compounds, than those hitherto adopted. As, however, neither ammonium, oxide of ammonium, amidogene nor sulphatoxygen has ever been isolated, it is correctly observed by Professor Graham, that to whichsoever of the hypotheses "we give preference, we can scarcely avoid using the language of the old theory in the present state of chemical science."

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THE END.

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